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Flying Antelope

New altitude record for antelopes established by three flying fawns

By ARTHUR NEWTON PACK

Photographs by the author and Charles J. Belden

RHAPS, had they been conscious of what was hap-ening to them, they might have looked down from he window of the hurtling airplane and seen that which was once theirs by right of possession. But they only wild creatures, after all, these three young ican antelopes. They had been captured as new-born from a herd in Wyoming, raised in pens on nursing s of cow's milk, and grown just old enough to risk ent. What was an air- to them!

d these delicate, big- animals been crated hipped by express for ng trip, with its many es, it is doubtful er they would ever come through alive to ern California. Now, ver, they were snugly on a bed of hay, d in by burlap which cted the interior of the ne and offered a par- between them and the s seat where I han- he "stick" and watched nstrument panel. This ong been a dream of —to help solve the lt problem of wild transportation. Now bove the world, pilot- ny own airplane and ng a load of wild res into the west.

d, gold, and blue, the ts rolled below. Moun- swelled to the hori- The tiny thread of continental railroad had wandered off far to the north, for we were on the airline route, the antelope and I. No signs of white man's civilization should disturb the emptiness—none, that is, except the comforting drone of the motor which made us, for the while, masters of the desert sky.

Long, long ago the Indians, who had known the great herds of wild antelope, built their own sky cities, with clustered dwellings of adobe or rock, upon the summits of steep mesas or crags that offered protection from their enemies. These ancient peoples, who were the first Americans, worshipped the gods in wild animal forms, and the great soaring eagles. What would they have thought of our great green and yellow bird, which carried the wild antelope in its belly, alive, and looked down upon the fastnesses of the Enchanted Mesa, upon Acoma and Zuni? The endless sweep of the desert country has always inspired strange and mystical thoughts, and now these seemed to dominate my mind, leaving only subconscious that mechanization which looked to tachometers and emergency landing places.

In an automobile I have followed the highways across northern New Mexico and Arizona. With horse and burro I have wandered into the desert wilderness. But never be-

PILOT AND PASSENGER

The author alights at the airport in Los Angeles with one of the antelope fawns that has just established a new altitude record for antelopes

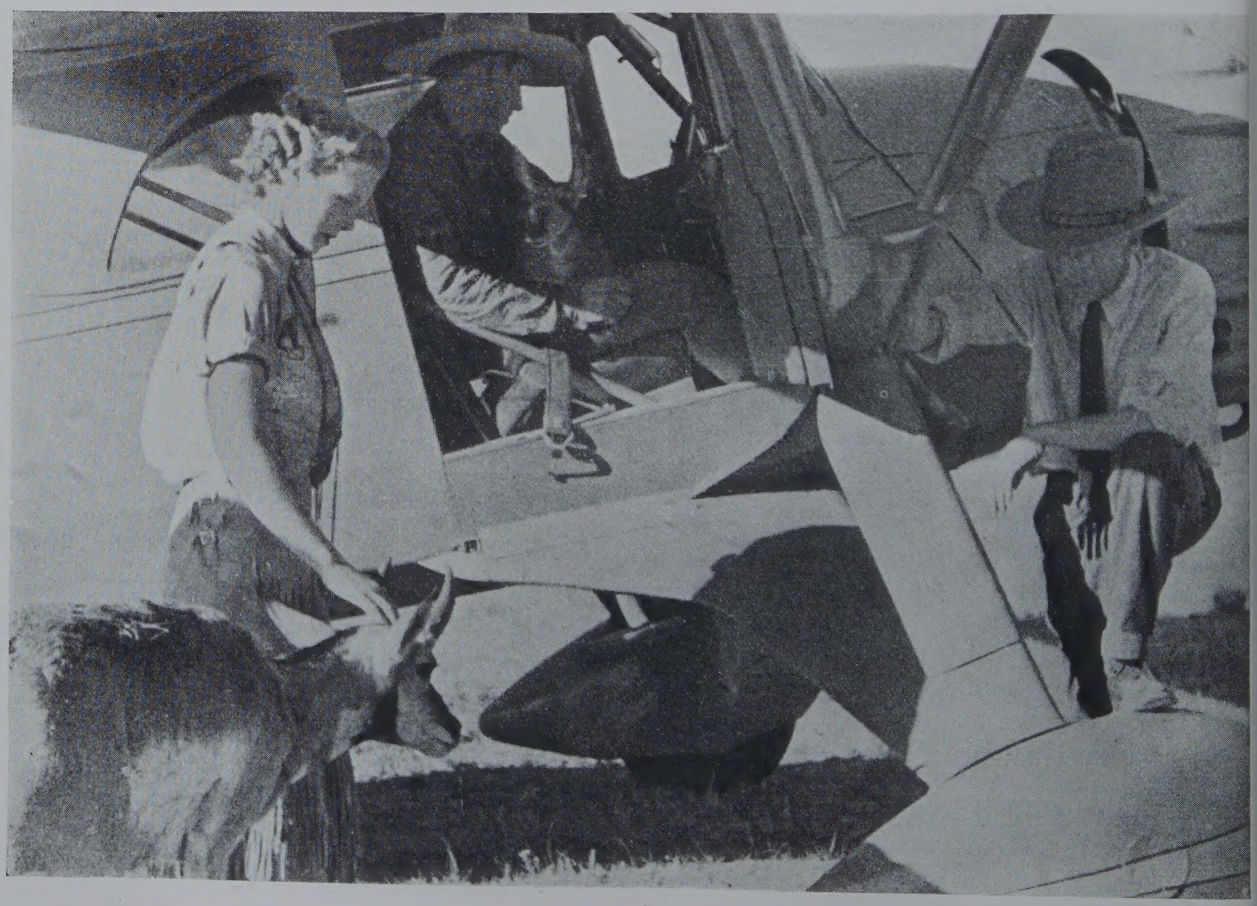
MEALTIME IN THE ANTELOPE PEN

The young members of the author's family feed their wild friends from nursing bottles filled with cow's milk. The three fawns that made the airplane trip were specially cared for until old enough for the flight

LOADING THE ANTELOPE PASSENGERS

A grown antelope, at the left with Anice Belden, calmly watches the proceedings. Mr. Pack, author of this article and pilot of the plane, is at the right. One young antelope may be seen in the lap of the man in the plane

fore had I viewed this land as the eagle from above. There, to the southward, stretched the open ranges toward Magdalena, where, under the care of the State Game Department, remain a few wild pronghorn antelope, which one may see and even legally shoot during a short season. Creatures whose curiosity drew them to red blankets waved by Indians, and so to death by bow and spear, are easy quarry for the marksman with a high-powered rifle. I have chased antelope with an automobile speeding at forty miles an hour across the flat plateaus, but only to picture their mighty leaps. Then, with man's most modern invention—this airplane which now carries us through the sky—I have tried the most exciting sport of all, swooping down upon the herd from above, holding the plane at stalling speed close to the ground, while my friend, with motion picture camera, kept his lens trained upon the fleeting band. When the great black shadow of our wings fell among them, it crept from the hindmost doe steadily onward until the leader of the band, for all his forty or fifty-mile an hour speed, saw it pass beyond and, with the roar of our exhaust in his ears, turned sharply off to one side. Climb, bank and turn! Again a downward swoop, again a buzzing camera, and so, repeatedly, until the movie camera was empty and we flew away, while the antelope re-



OT AT ALL DISTURBED WHAT IS GOING ON
Young antelope, in the lap of Jack Bell, interested in the adventure

med their briefly interrupted azing as if nothing had hap-ned.

That was in Wyoming on the nches of the Pitchfork Ranch, here my friend, Charles J. Bel-n, raised the three that now e peacefully in the hay behind e.

These wild creatures are in-pable of those recollections at occupy a human mind. ence, they can not know that e wind has blown us a little uth of our course, and now we e passing over what appears to be a carelessly strewn nch of matches on the red desert floor. Nearby is a at group of adobe roofs about a paved and well-kept urt. It is a landmark that will direct us on, for those relessly strewn matches are the giant logs of the Petri-d Forest of Arizona, and the buildings are govern-ent headquarters.

The railroad, with its companion ribbon of oiled high-ay, returns to pierce a spot of green where tall chimneys ark the town of Winslow. Beyond it stretches a broader bbon crossed with yet another—the airport where we ust come to earth for gasoline and oil. I cut the throttle. l all flying were only like this silent floating through ace, this gentle and gradual settling to the ground!

"What have you t there in the ck?" asked the rvice man, peering . "Little deer! ell, I'll be horn-oggled! Mind if I ll my daughter? ell, I guess it's the st time anything ke that ever had an rplane ride. They n't look fussed up out it."

We are up again. ill these sudden anges of altitude upset our wild passengers? It can't be helped, for we must get over that hump ahead. Below is the famous meteorite crater where a fragment of star dust once struck the earth and buried itself in the hard ground with a force that no man-made projectile ever achieved. From our lofty height the story is as plain as ABC, and requires no guide book to explain. There is a storm brewing on the San Francisco Peaks, but the last weather report says that we have a safe margin. The Painted Desert glows in the sunshine—a vast wilderness still, and likely destined so to remain. There live the Navajos who, too, so well knew the vast pronghorn antelope herds of long ago. Government men are trying to reestablish pronghorns on the south rim of the Grand Canyon. They have had to

EALTIME N ROUTE
Although the plane did not provide a hostess, the passengers did not lack for good attention

A LARGE HERD OF SPEEDING ANTELOPE ON THE WYOMING PLAIN

The airplane, at stalling speed, outstrips the swift runners of the plains but the motion picture camera "shoots" them and then leaves them to return peacefully to their grazing

bring the animals by train and truck from far away. How much quicker and safer for the animals is this modern air transportation that we are proving.

The Grand Canyon itself hides behind a deep black wall of rain that extends in a thinner curtain across our course. For a moment or two it dashes violently against the plane and pours back up the windshield in obedience to the rush of wind, at the same time seemingly defying the law of gravity. It almost drowns out the roar of the motor. Then we are through it into the smiling sunshine and speeding on towards California.

Again we float down for gasoline, and then speed on over the rough bad lands that bound the Colorado River. Jagged pinnacles reach up to ensnare us, but in vain. Through another, more drizzling shower, and out over the Mohave Desert, where a great dust storm rages below. The upward current of air drives us higher and higher. At ten thousand feet the bumps are ironed out into smooth, swift progress. The antelope are lying peacefully upon their bed of hay—not in the least restless; nor have they at any time gotten excited and attempted to jump against my back or disturb my piloting. Perhaps they are just a little air-sick.

Blue-gray and green against the now cloudless and slightly hazy sky, rises the Coast Range, the last barrier to the Pacific. To us it is nothing. Mint Canyon winds below, but our course is straight on. Even the gleaming dome of the Mt. Wilson Observatory is but a dot of white. I close the throttle and float down over the million roofs of civilization, over the tall buildings, the vivid green orchards, the maze of white roads and black, down, down to the airport that stretches wide arms of safe welcome.

There is a crowd of people there, with two men shouldering through. One, true to instructions, carries a thermos bottle of warm milk for our antelope passengers. We pour the liquid into pop-bottles and affix the nipples. Sounds of contented sucking. Then, one by one, we lift the big-eyed creatures in our arms and carry them to the waiting car. It will take them to a private game park which will be their new home. Cameras click and whir. The crowd has grown even larger. Suddenly a stentorian voice begins. "Step up, folks. Step right up and see the little deers and moose that flew across the country by airplane. If they can do it safely, so can you. Step right over here and buy your tickets for an airplane ride!" But as to whether my antelope passengers helped to stimulate airport flying business that day I never knew. Together we rode out to the park where they were to roam. Like them, I felt that it had been a long time since breakfast on the home ranch and I craved more food than warm milk in a pop-bottle.

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March is the month of winds and in that issue we have another of the interesting articles by Charles Fitzhugh Talman telling of the tremendous amount of work and damage done by winds in moving dirt from place to place, and about the dust storms of the past. Also in March, Frank C. Hibben delves into the language of "the mountain canary" or burro, entertainingly letting us in on burro conversation. For the garden-lover, Allen H. Wood, Jr., introduces us to many varieties of irises not known to the average gardener. Many readers will remember the story of Andy, a sandhill crane that spent a time in jail and was released after he had gone on a hunger strike. Now George L. Bird gives us the final chapter of Andy's extraordinary life. These are a few of the March features, plus, of course, another interesting rotogravure section.

WINTER IN A SUBURBAN WILDERNESS

The author's cabin and sanctuary is less than ten miles from New York City, yet seems many more

NEW YORK'S FRONTIER

Yes, there are wild havens within ten miles

By ROGER N. BALDWIN

Photographs by John Williams

LITTLE oases of woods in the deserts of great cities are common enough, and some, like Central Park in New York, are famed for their records of bird migration. But the association of wilderness life with the immediate environs of a metropolis always strikes the uninitiated with surprise and often incredulity. Yet within ten miles of New York is an area as untouched by the inroads of civilization, as primitive in its wild life, as it was in the days of the earliest settlers.

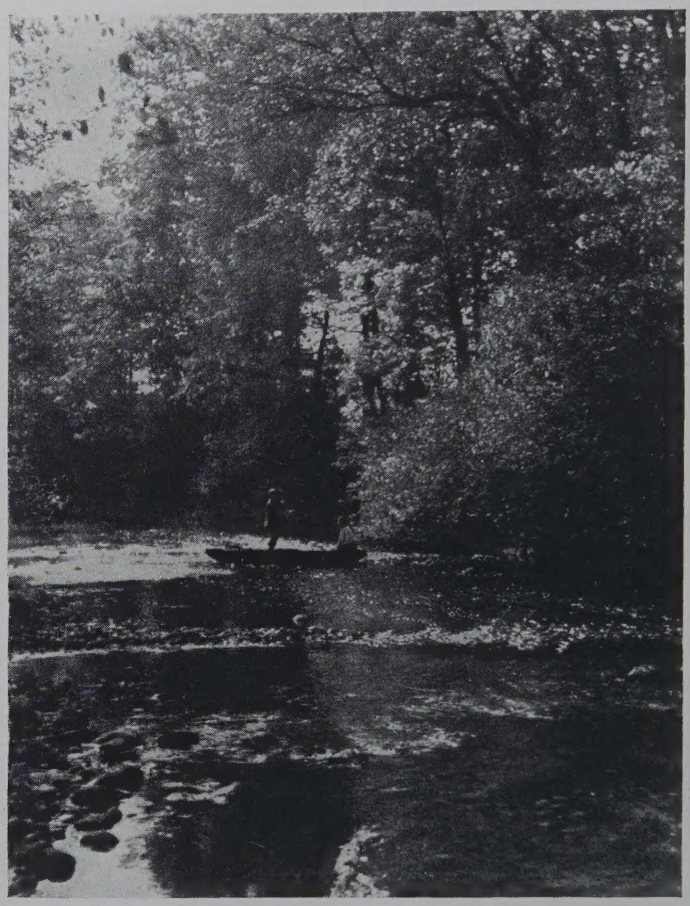
When I moved to New York some fifteen years ago I sought at once for a refuge in nearby country where afoot or in canoe I could get as close as civilization permits to the conditions of wilderness. I wanted to camp, without the sound of motors or of trains, in a spot undefiled by picnickers; where I could put my canoe on the water and paddle for miles without passing a house; where I might swim stripped, or lie on the bank in the sun with a book, alone with the sounds of the woods and the stream. A swamp to explore; deep woods to tramp in; the bigger and wilder birds at hand; animal and plant life untouched.

It seemed impossible. Friends smiled at such romance. The amateur naturalists among them had contented themselves with wild life in the Bronx or Central Park or Staten Island. Their excursions yielded them satisfying lists of birds. There was "country" in New York City, they said—real farms, forests on Staten Island, long stretches of beach for shore life, and over in New Jersey, vast marshes for study.

But the heart of a lover of rivers, canoes and deep woods does not throb to such calls. I had heard of wild places on the back of the Palisades, where deer still ran, and copperheads abounded. Duck hawks bred on the cliffs, and even hunted pigeons in the heart of New York. Few people lived there. It was hard to reach, and the land was held in large estates. In the valley behind ran a tidal river. Somewhere that river ran fresh. I followed it up through Bergen County, the northernmost county at the east end of the state, and opposite upper New York and Yonkers. And there, only a little more than half an hour by train from New York, enfolded in the back country away from roads and suburban settlement near the railroad, a wilderness as completely satisfying as the most ardent woodsman could wish. Along the Hackensack River, too low for building, stretched wooded swamps, thick, rank, lofty, with trees of heroic size. The oldest country people said they could not remember when they had ever been burnt over or logged, and the rings of some that had fallen and were sawed showed more than two hundred years. Through wooded swamp and lowland the little river flowed from its source only fifty miles away, never more than a hundred feet above tide-water, but yet clean and fast over rocks and yellow

sands, jammed here and there by fallen logs and brush.

I brought over my canoe and explored, pushing up-stream, fearful that somewhere the wilderness would stop, that houses and a town would appear. But the woods lined the stream unbroken, save, at long intervals, for a bridge and a country road, and once for a mill-dam and an old grist-mill still grinding—the last of half a dozen on the river. A few camps, a few swimming holes made by country boys, a farm or two running down to the water—these alone the only evidences of the hand of man. Otherwise a wilderness of trees, swamp and stream as undefiled as in the days of the Indians. Far off now and then an engine whistle, and near the bridges an occasional car. A flat-boat was moored on the bank here and there in the quieter stretches for some country boy's fishing. One or two canoes lay on the bank in fifteen miles of paddling, but not once in that trip did I meet another boat afloat.



NOW AND THEN A FLATBOAT AND FISHERMAN

However, civilization intrudes seldom along the stretch of the Hackensack River described in this story

In such a haven wild life abounded. Deer tracks were common in the soft mud of the river shore. Muskrat houses and holes, mink tracks, —and in the night when I camped out under a single great white pine rising out of the forest, the noises half heard, half guessed, of a host of little animals, were all about me. Wood ducks rose from the river at intervals as my canoe came around a bend; great blue herons flapped over the water ahead of the canoe; an osprey rose with a fish. And as evening came on the woods resounded with the ringing song of the veery, dominant above all others, symbol of bird-life in wet, dark cover.

New York was less than ten miles away as the crow flies. On the horizon at night the lights of the city were reflected on the clouds. By day, if you climbed a big tree, the high buildings down-town could be seen below the rim of the Palisades to the north. I do not know. I never tried it, but the country people said you could "if anybody wants to."

That trip up river was fifteen years ago. It settled me into putting up a camp on the river bank not far from a town easily reached from New York—easy enough to commute in summer weather. Before camp breakfast over an outdoor fire, I could paddle a bit while the water boiled, get a long swim—and, without too early rising, walk to catch the 8 o'clock train like any commuter. Yet unlike him, I could live in two worlds—one that was there before even the railroad came, and the one he knew.

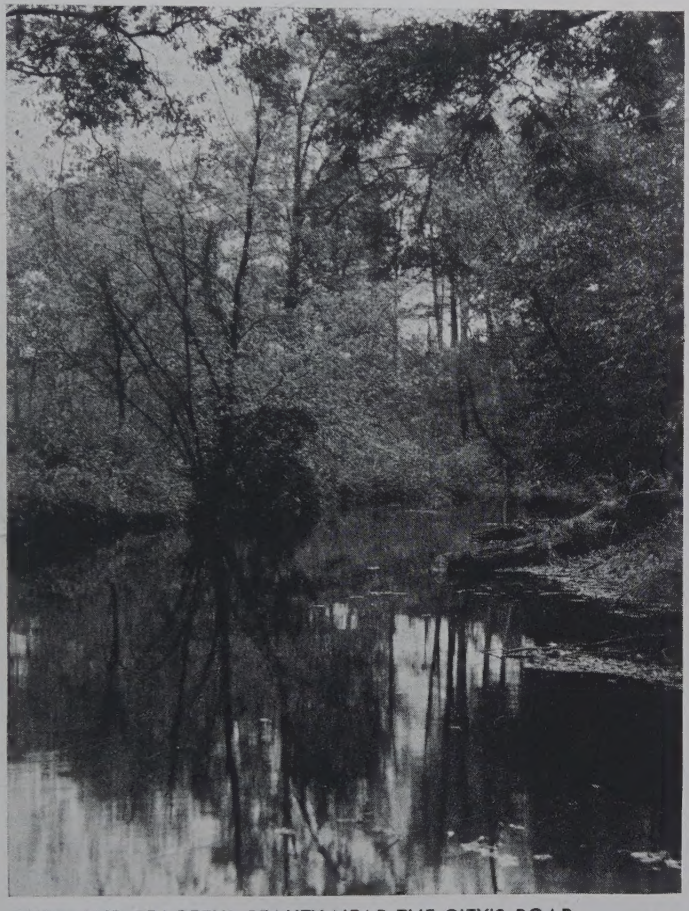
For fifteen years now I have escaped to that wilderness from New York; to this last frontier of a great city, still intact, and indeed almost guaranteed by its increasing ownership by a water company to protect its water supply.

The old mill has gone, and the old miller is dead. He hung on till competition made grinding unprofitable, and fewer farmers brought grain. The reservoir on the lower river has been extended up-stream, and some big woods cut. Otherwise nothing has changed. The river is still used only by country boys for swimming, and for trapping in winter, by fishermen in the season, and here and there by a few campers. The old farmer from whom I leased my land, who as a boy cut his initials sixty years before in the bark of a beech by the river, died on the land on which he was born; but the tree stands with the letters and date, 1858, still clear.

Suburban life gradually creeps over the landscape; concrete roads replace the winding ways, conventional cottages with slick lawns and ornamental shrubbery invade the farms, and a golf course or a public swimming pool brings the crowds in summer from miles away. The last big stand of virgin hemlock, through which the sun never penetrated, was felled only three years ago. But while the old farm frontier yields, the river wilderness stays, a thin strip of wholly natural life undesired by neighbors to whom swamps and deep woods suggest only mosquitoes and torn clothes.

The deer still run along the river or kick up their heels in farmers' truck gardens of an evening. They can roam in forest broken only by an occasional road all the way from the Ramapo Mountains fifteen miles to the west, though the roads and settlements have, I hear, kept them from their old runs on the rear of the Palisades. The little animals abound. A few years ago beaver, which had been exterminated in New Jersey a century back,

reappeared with a single house and dam only a few miles west of the Hackensack on a forest brook. They had doubtless migrated from the Interstate Park to the north. Visitors disturbed them and they have moved, not far, I reckon, though I have not followed them up. Muskrats, though trapped mercilessly along the river, hold up in numbers. Above the mill dam one winter I counted twenty-two houses. The miller forbade trapping. Possums are almost a nuisance, they are so common and so omnivorous. Set a box-trap for a hunting cat, and four times out of five a possum will get into it first. Despite what I know of their destruction of ground-nesting birds, I always let them go. I prefer to let Nature keep her own balance. But cats are a different breed, and man's intervention in the scheme I try to minimize by disposing of them.



QUIET AND PEACEFUL BEAUTY NEAR THE CITY'S ROAR

They say one can see the tall buildings of Manhattan from the top of a tall tree if one cares to look

Mink, which I am aware of only by tracks, are so common by the river that one diligent boy trapper in one winter got over twenty pelts when mink were selling at figures to yield him a living, along with the muskrats. Weasels are too common. They have repeatedly cleaned out the colonies of wood mice or wood rats under or in the walls of my cabin. Even in daylight I occasionally get a flash of one when I am lying still in the woods. Two young ones, almost grown, confused by automobile lights on the road one night, were taken back to camp as pets for a few days, and were so familiar that they both climbed into bed in the middle of the night. Their bloodthirsty future did not deter us from letting them go. Raccoons and skunks, less common because more easily hunted, are still numerous.

The white-footed mice or the wood rats are always with us, one or the other, never both together. Over the years they have alternated in possession. How they yield one to the other I do not know. I presume that either the wood rats chase out the mice or that the weasels or mink clean out one colony, and the other later moves in. Both have on occasions become so tame that they would play around on the cabin floor of an evening while I was quietly reading, and come to my feet for food.

The Museum people, some of whom I invited out to the wilderness, at once found it a store-house of strange toads, frogs, salamanders and river life—the wildest close to New York they had seen. I would not venture to describe what was in their bottles, for I have pretty well kept my head above water. My slight knowledge of river inhabitants is confined to long strings of trout, eels, perch and pickerel in the hands of country boys—more rarely of the town fishermen—and to a campaign of my own against the destructiveness of carp coming up river from the reservoir. These aliens rob our natives of food and shelter.

Along the banks every mile or two are wood-chuck burrows, real wood-chucks that scorn the open places and travel only on their well-worn paths over tree-roots. All the squirrels live about—gray, red, flying and chipmunks. Shooting, or the hawks and owls, thins them out some years, but they always come back in numbers. You could almost chart their rhythmic cycles. I have heard credibly that an otter lived at a spot on the river some ten years ago; and I once saw a fox. But these are animals of the past in a little wilderness surrounded by farms and homes and men with guns.

Of the birds there is the always exciting mixture of two life zones meeting, with the unexpected discovery of some stray from the north or the south. Game birds, however, are few. Both wood and black ducks breed, although the numbers have declined. Woodcock are common and hold their own. One pair nested one year in a clump of trees in a large swampy field in the center of the town; and I used to hear the male in spring take off in his flightsong from the boys' baseball diamond, not far from the lights of suburban homes. Bob whites were shot off years ago, and only recently a few have come back, probably introduced. Pheasants, though hunted relentlessly, manage to keep ahead of the hunters.

Of the larger birds, the herons are by far the most conspicuous and common—great blue, night and little green may be seen anywhere along the winding little river, flying ahead of the canoe. Egrets and little blues visit the reservoir and lower open river irregularly in summer.

(Continued on page 95)

Departure

The story of a starting point and a great measuring job

By ELLIOTT ROBERTS
U. S. Coast and Geodetic Survey

WHERE does a ship start her journey—what is her point of departure? At the dockside, one might say. Off the lighthouse, or by the sea buoy, claims the navigator. The chartmaker has another answer. Therein lies a story.

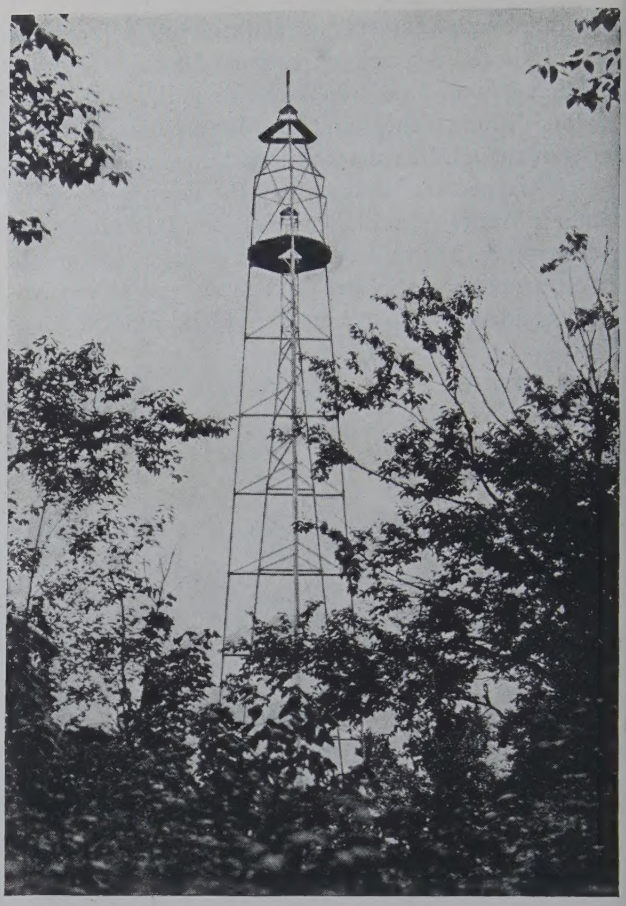
To see and understand it properly, one needs an encompassing view. There is no better viewpoint than that of the surveyor as he works at making the charts, for his is a far-flung enterprise, and Nature's loftiest vantage points are none too good for him. So let us, in thought, toil with him to the summit of one of those great mountain peaks that look out over the blue Pacific. Let us go with care, watching over the safety of our equipment, for we must camp a while on our perch, and there's work with delicate instruments to be done while there.

Climbing through the giant forests and over tilted uplands, we reach the heights from which we begin to see vistas of shaded valleys far below, and the upthrust pinnacles of distant peaks against the sky. Far to the westward there is a glimmer of sunlit water. Onward we go to the highest place, for we must view all the other peaks, and sweep our gaze over the expanse of the ocean.

Far at sea can be seen an American ship, outward bound on its mission to foreign lands. Deep in the hold of that dwindling ship lies American grain from the plains on the other side of the mountains. Just an item, you may say, in the business of exporting American commodities. Just ordinary Kansas grain, come across the mountains by rail, and now transshipped to that disappearing freighter for its long Pacific voyage.

That grain, let us say, "took departure" from Meade's Ranch, way back east in Kansas. Now here's the peculiar thing. *So did the ship!* And so do we, as we unroll our maps and charts to find the latitude and longitude of that survey monument—the triangulation station at our feet—crowning our lofty mountain peak!

"How now?" you protest. "That ship cannot sail within a thousand miles of Kansas. Does not her logbook clearly state, moreover, just where and when she took departure from the sea buoy at San Francisco Bar?"



STEEL TRIANGULATION TOWER
Erected so that the chartmakers may see ahead to make the measurements that all lead out from Kansas

All that's quite true, one admits, but think—there's more to the story than that. The essence of navigation is in knowing a ship's location on the sea. When they wrote down her starting position—her point of departure—they merely borrowed for their own use the known and charted position of that buoy. Whence came the position of the sea buoy, so carefully recorded in the logs of countless ships? How did the chartmakers find its latitude and longitude—know where to place it on the charts? From the mountains and headlands ashore, the lighthouses, and the survey monuments? Yes, but even they had to be located and put in their proper places. All the features of the land and sea may be surveyed and delineated, but how, you may ask, are they all fitted in among the meridians and parallels, those reference lines on the chart, fixing the positions of all things?

THE STARTING POINT
The monument at Meade's Ranch, Kansas, the starting place of all chart surveys

Those lines indicate distances and directions from an arbitrary zero point, established as the starting point of all earth measurements. For most of the civilized world, the

ACTUAL MEASUREMENT

In many places the surveyors measure out the distances between points with a highly accurate tape made of metal called invar, which keeps practically a constant length during all changes in temperature

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OBSTACLES MEAN LITTLE

The survey must go through, and the surveyors go everywhere despite barriers that would daunt the average individual. Here is a party carrying on its work of charting atop a lofty, snow-covered peak

peak of the observatory dome at Greenwich, England, is that starting point. All charted things must be measured off from that point, that they may be fitted to the proper reference lines, and correctly placed on the charts.

At sea, where one has not the means of making direct measurements from Greenwich, the positions of stars are observed—stars already observed upon from Greenwich, so the measurement is made indirectly. On land, where there is need of something better than these indirect measurements, those who make the charts measure directly, in actual fact, along the ground. Since they cannot measure directly across the Atlantic, they have their own secondary starting point, and it has been related with Greenwich by the most accurate star observations they could make.

Meade's Ranch, a concrete and bronze survey monument in Kansas, is the American starting point. It is not a zero point, for Greenwich better serves as that, but its own position on the map is basic for American surveys, and every bit of chart that is made all around our country is by actual measurement from this triangulation station in Kansas.

Now perhaps it is clear what was meant by saying that the ship took her departure from Meade's Ranch. That buoy, the last thing she sighted on, going out, was located by tape measurements and geometric computations, the highest type of long-distance land measurement, direct from that survey marker back in Kansas. So are all the rocks, shoals, and channels, and the thousands of landmarks on the charts. They are measured from the starting point and from one another, so that objects in far-separated places lie correctly related to one another and to the common system of latitude and longitude reference lines. If the ship can make good the distance and direction of run shown by the chart to separate two places, she cannot fail to arrive all safe, and her thanks must go to the measuring process used by the chartmakers.

Our trip to the mountain top is a contribution to the tremendous task of making all these measurements. The work done there consists of theodolite observations to find the bearings of a host of near and distant peaks, on each of which is a triangulation monument and a signal device to direct the pointings of the theodolite, of buildings, steeples, lighthouse towers, and many another landmark.

The chartmakers scale one peak after another, moving along across the country, carrying the measurements from Meade's Ranch. In the flat country they build towers so they can see a satisfactory distance, and where the forest is so high that they cannot easily do that, they get right down on the highways and railroads to measure the route with tapes. They go through the length and breadth of our great land, for navigation charts, like inland surveys and maps, must have starting points. When they have done their work, no little cove on the coast of Maine, no marshy lagoon along the Gulf coast, or little inlet in the upper reaches of an Alaskan sound will lack exact location.

They survey the ocean and the coast, but before the proud battleships of our Navy venture from their berths, or the crack transatlantic liners and dingy tramp steamers

set out to sea, the chartmakers must also be explorers. Over deserts and plains they go, through swamps and tangled jungles, and over glaciers and precipitous peaks, laying the foundation of the great coordinated chart system that spells safety to the ships of the world.

Often the drivers of laboring motor trucks, while travelling the roads of inland states, have been hailed and asked what they did, where they were from, and where going. Especially were they asked why the Coast and Geodetic Survey ventured so far from the sea, the obvious domain of the chartmaker. Apt as reply to these questions would be the statement that they had taken departure from Meade's Ranch, Kansas, were carrying a course to the sea, and that there they were to show the way to cargoes of Meade's Ranch grain, enroute to the hungry mouths of Italians, Patagonians, and Filipinos.

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Drawing a Bird's Bath

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By
DAVID J. MORRIS

AN ARTISTIC and serviceable bird bath can be made from the rear-end housing of an automobile and a flower pot saucer. The brake drum rear-end housing is set several inches in the ground and dirt packed around it. The upper section, unbolted in the middle, provides a large surface on which a flower pot saucer may be set and this filled with water. A coat of paint is necessary. If this is placed at some spot in the flower garden or yard, immediately the birds of the neighborhood will be attracted to it and begin the taking of daily baths. The one illustrated was made by Miss Georgie B. Lucas of Austin, Texas, a little high school girl who enjoys Nature and has made for herself in one corner of the family yard a flower garden.

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"Skeletons"

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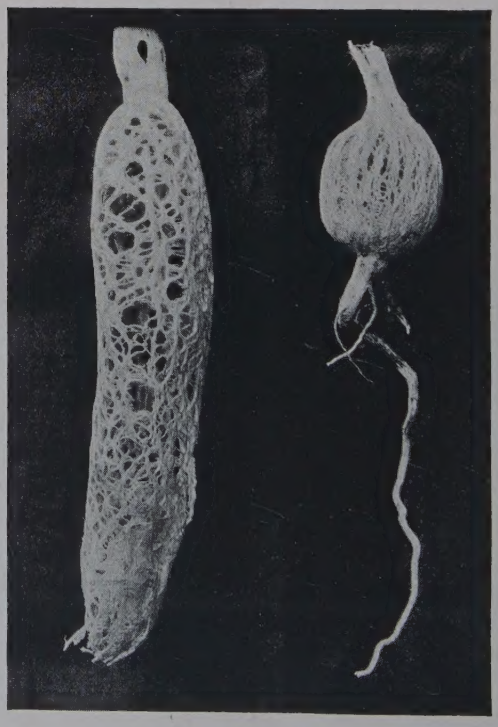

By C. A. LUDWIG

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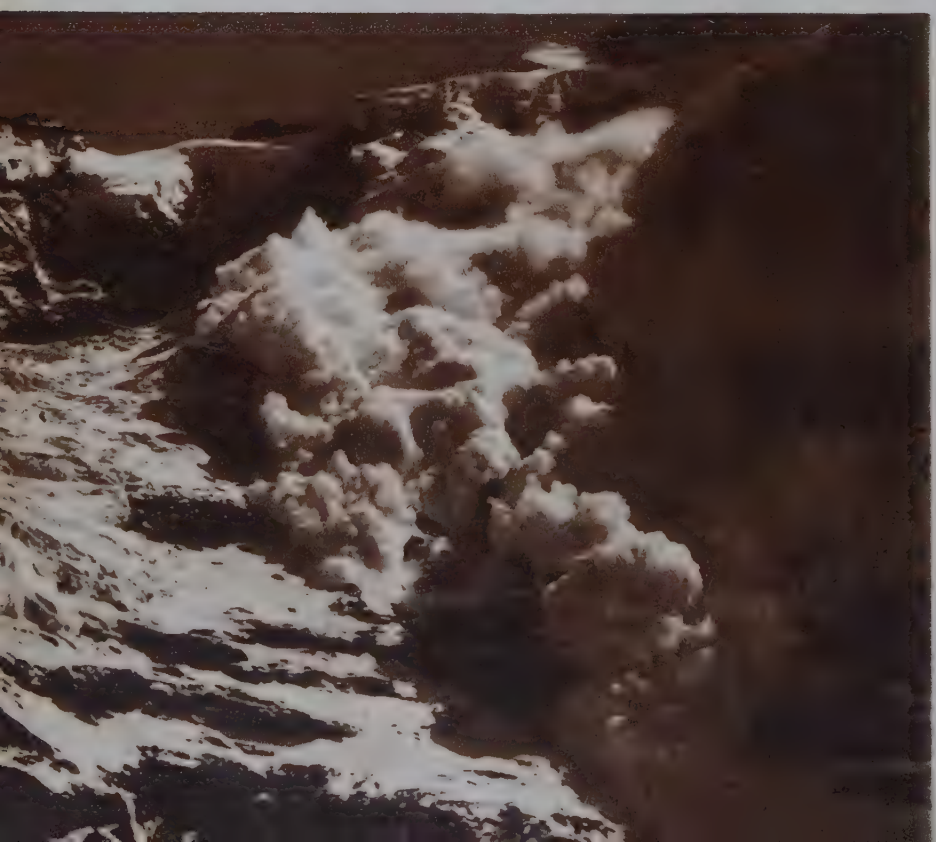
THE accompanying picture shows "skeletons" of a couple of radishes as laid bare by two or three months of last summer's weather. Because of the absence of the owner of the garden while on a vacation they were allowed to grow to full size and mature their seed. They were then pulled up and thrown on the trash pile. A few months later, when they were next noticed, they were in practically the condition shown here. Only a little cleaning up was necessary to get them ready for the camera. Note that the network of vessels forms a hollow shell, with the interior entirely empty. Thus are radish structures graphically shown.

THE OVERWHELMING MAJESTY OF WINTER AT
ST. MORITZ, SWITZERLAND

Photograph by Albert Steiner

A GLORIOUS VISION OF WINTER DAYS AT
ST. MORITZ, SWITZERLAND

Photograph by Albert Steiner



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A Jungfrau avalanche in the Bernese Oberland in Switzerland. While many have seen and heard the awesome event of cascading snow, rock and soil, it is only on rare occasions that a photographer is on hand to record it. Marga Steinmann was one of the fortunate and was able to catch the white cataract as it plunged down the mountainside. Some avalanches have done extensive damage, carrying with them human lives, or even burying homes or tiny mountain villages beneath them.

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Nature Works in Stone

When wind, water and time join hands as sculptors, or even when they work separately in stone, they produce many weird, interesting and spectacular results. Water is, perhaps, the most active of Nature's sculptors, patiently, year after year, wearing the hardest rock into strange forms. Wind and weather work best with the softer formations.

Above is a typical bit of sculpture from the Dakota Bad Lands photographed by B. L. Brown. It is appropriately named "the petrified night cap."

At the right is Miracle Rock, believed to be the largest balanced rock in the world. The rock is sixty feet high and it is estimated that it weighs twelve thousand tons. It is balanced on a slender base only three feet thick. This prank of Nature is found near Grand Junction, Colorado.

Here are four more pieces of Nature sculpturing. At the left the famous Natural Bridge in Virginia fashioned by an ancient river. Photograph by Harry W. Ludwig. Below, at the left, the famous Rainbow Bridge, God of the Navajos, the eternal rainbow in red sandstone. Photograph by Hugh Stevens Bell. Above is the interesting Arch Rock, a product of water sculpture on the shore of Lake Superior; and, below, a formation in the Tongue River Canyon of Montana known as the Castle of the Gods. These two photographs are by B. L. Brown.

Above is the Devil's Slide in Utah, a peculiar outcropping that seems to provide a natural toboggan route. His Satanic Majesty is also given the credit for the interesting formation at the right—the Devil's Post Pile, one of our National Monuments located southeast of Yosemite Park in California. This imposing pile of crystallized basaltic rock is on the north fork of San Joaquin River, and a road now leads to the rim of San Joaquin Canyon affording access to the Post Pile by trail. Photograph by Fred H. Skinner. At the right is one of the curious and fantastic rock formations found in the Garden of the Gods at Colorado Springs, Colorado. It is called the Seal and the Bear.

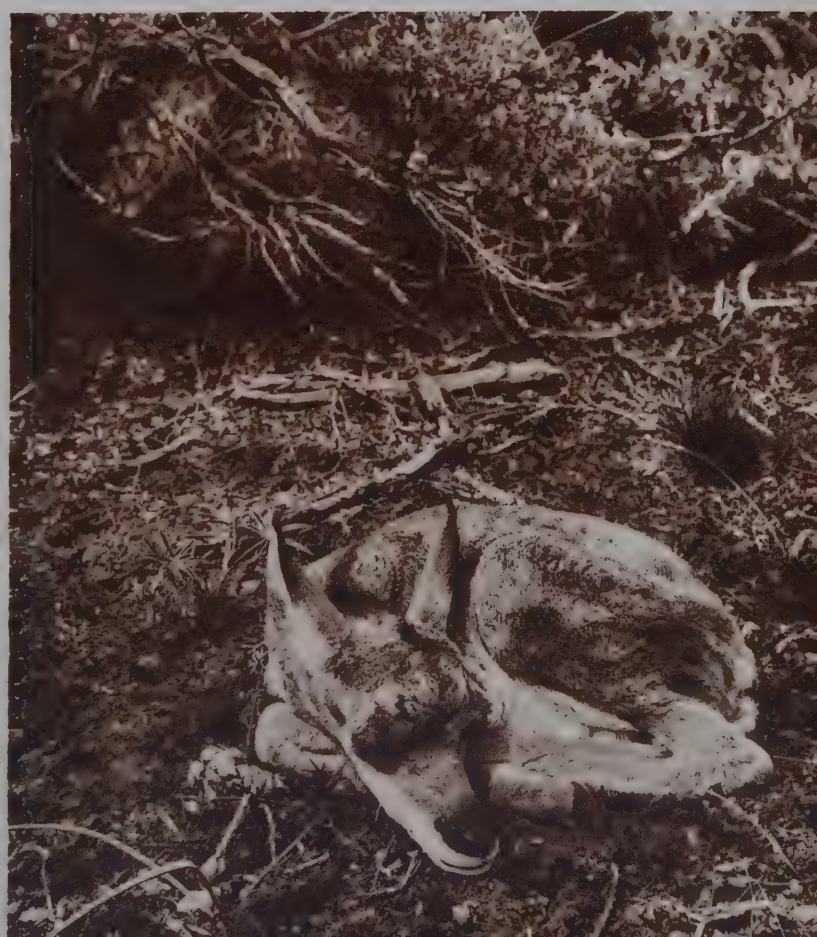
There are many instances of human likeness in rock, not to include the mania of the moment for carving upon the face of every stony mountain. One of these is the Sphinx of Kings River Canyon in southern California shown above at the left. There is also the Martha Washington Rock at Colfax in the State of Washington. Below is Pompey's Pillar in Montana, near which Lewis and Clark, the pioneer explorers, camped. Photograph by B. L. Brown.

ANTELOPES

Our American pronghorned antelope enjoys a unique distinction because it is the only member of its family. Not a true antelope so far as relationship with antelopes of Africa goes, scientists have classified it all by itself. Its hollow and branched horn, which renews itself annually, is one of its individual characteristics. The pronghorns have been so ruthlessly killed that only a small part of the original numbers remain.

Charles J. Belden, Wyoming rancher, has however, taken an active interest in trying to protect and restore the antelopes. Above, one of Mr. Belden's horned friends drops in for a half-hour of the Philharmonic concert, or, perhaps, it's Amos and Andy who attract him.

At the right is an entirely alive baby antelope that has assumed its protective pose by acting what appears to be a quite dead youngster. Photograph by Finley.

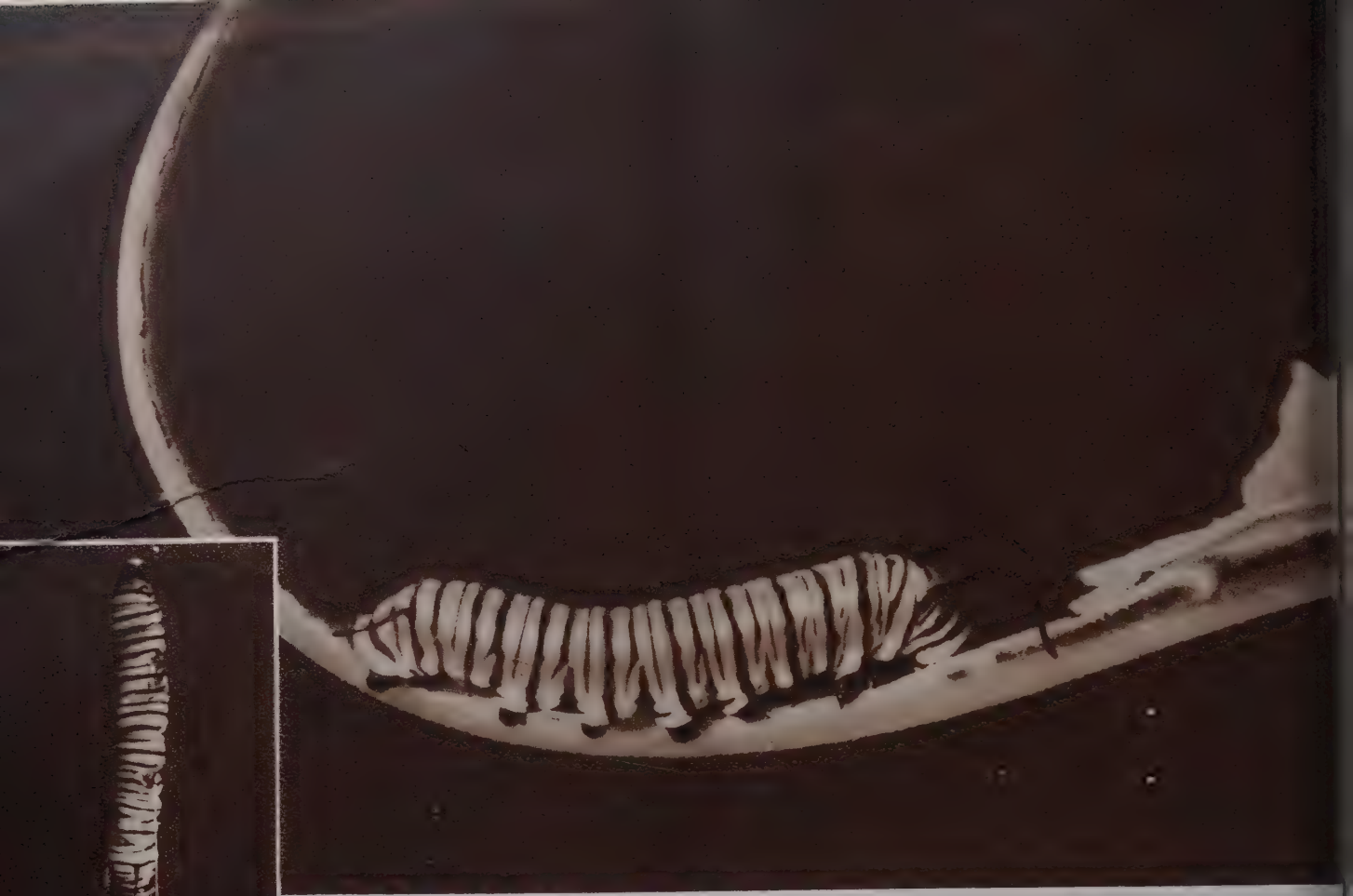


Above is the stately eland, the largest of all antelopes. It is found in considerable numbers in northern British East Africa. Photograph by Martin Johnson.

Above at the right is the handsome black buck, an antelope from India. The males only have horns. When it is startled this animal makes several remarkable bounds into the air before it races swiftly away. Photograph by H. Armstrong Roberts. Then we have the rare and beautiful Beatrix antelope of the Arabian desert, distinguished for its handsome horns. At the right some of our American pronghorns in full flight. They were photographed by William L. Finley from an automobile going thirty miles an hour and clocking the antelopes' speed.

PELICAN, ONE OF OUR MOST INTERESTING AVIAN FISHERMEN, WHOSE BILL HAS INSPIRED A WELL KNOWN JINGLE. THE BROWN PELICAN IS LOUISIANA'S STATE BIRD

Photograph by H. Armstrong Roberts



The Monarch

PHOTOGRAPHS BY FRANK TRIEM

The monarch butterfly, whose Latin name is *Anosia plexippus*, is one of the most common and most interesting of our butterflies. With its black-veined wings against a background of orange, its black wing borders spotted with white, it is a striking insect as it hovers about our gardens or gathers in large numbers for its migratory flight to the southern states for the winter.

At the top of the page is the worm, or larva, of the monarch, a striking caterpillar with its bands of black, white and pale green. It can be found from late spring until early fall, usually on the leaves of milkweed. It is a hearty eater and grows to be from one inch and one half to two inches in length.

At the left we see evidence of a tragedy, the larva having become the prey of an ichneumon fly, which had laid eggs in the body of the worm. From these eggs tiny grubs hatched, descending by silken threads to the floor of the cage in which the monarch larva was kept and then entering the pupal state themselves.

On the opposite page is, first, greatly enlarged, the beautiful "little green house with golden nails", which represents the chrysalis stage of the monarch. Gradually the lovely green of the chrysalis fades and the "nails" tarnish as the butterfly develops within. Finally the shell of the chrysalis splits and the butterfly emerges, hanging to its erstwhile home as its wings expand and dry. Then it is ready to spread them and float forth.

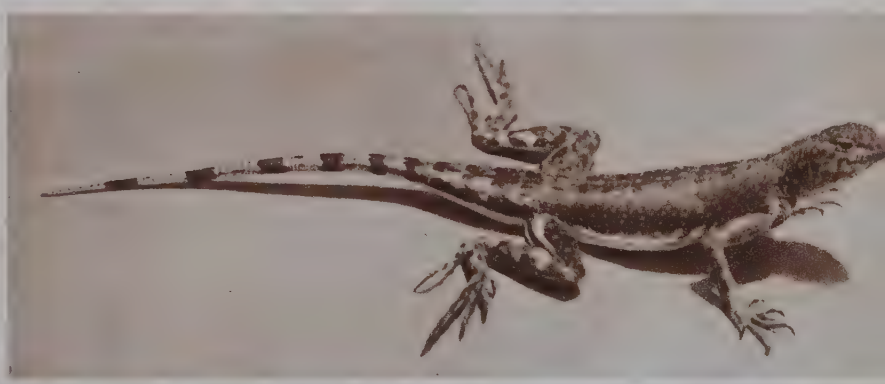
Above is the Douglas horned lizard, which is really hardly horned since its "horns" are mere tubercles. It is one of the smallest of the species and is found in the north Pacific region. Next to it is the common swift or fence lizard, so called because it is often found scampering along old fences.

Above and at the left are two color phases of the collared lizard. At the left is the male with brilliant colors—green predominating—of the breeding season; above is the female who takes on equally striking colors as the time for egg laying approaches. All photographs by L. W. Brownell.

The gila monster is a slow-moving lizard with a surprising ability to defend itself. It is among the reptiles highly dangerous to man, although it does become tame after a period of captivity. Photograph by Brownell.

A young chuckawalla. This lizard is confined to the southwestern part of the United States. It is a dull rusty brown color, the young being banded or marbled. It is slow moving with a waddling gait, and lives largely on flowers and tender leaves. In captivity it will slowly starve unless it is given the heat of its desert home.

The gridiron-tailed or zebra-tailed lizard has the distinctive habit of carrying its tail curled over its back as it seeks a hole or other means of escape. Whether this is a gesture of defiance or not, who can tell? This is one of the smaller lizards and an interesting one to the desert traveler, from its picturesque gait and carriage. Photograph by Charles M. Bogert.



A desert iguana whose tail had been lost and who grew a new end on it, but apparently forgot to adorn it as it should be. This lizard is found in the open country of our southwest, especially among creosote bushes. It feeds on flowers and insects. While it is not a small lizard it does not compare in size to the large tropical members of this group. Photograph by Charles M. Bogert.

One of the common iguanas of tropical America, where it is extensively eaten as food. It lives largely in trees. Photograph by Elwin R. Sanborn.

"Down Under"

The Australian kookabura or laughing jackass is a true comedian of the bird world. At dawn it joins its mates in a gale of merriment, and again just after sunset it seems to enjoy another period of hearty laughter. It lives mainly on small reptiles, insects and their larvae. With it we see Australia's most beautiful songster, the magpie. It, too, is valuable as an insect destroyer.

The little koala is now familiar to many through pictures, but it is not, unfortunately, abundant in Australia, having been much persecuted for its fur. It is now protected and cannot be shipped out of the country. Here the mother koala is hugging a store "teddy bear" to her breast.

At the right is the Australian opossum, its numbers also terribly diminished because its fur was so much sought. It now enjoys protection for most of the year.

The kangaroo is, of course, Australia's national animal. Here we see a mother and baby. The latter travels in mother's pouch for two or three months, getting out only to stretch a leg and popping back in case of danger.

Photographs courtesy of the Australian National Travel Association.

Feed the Winter Birds

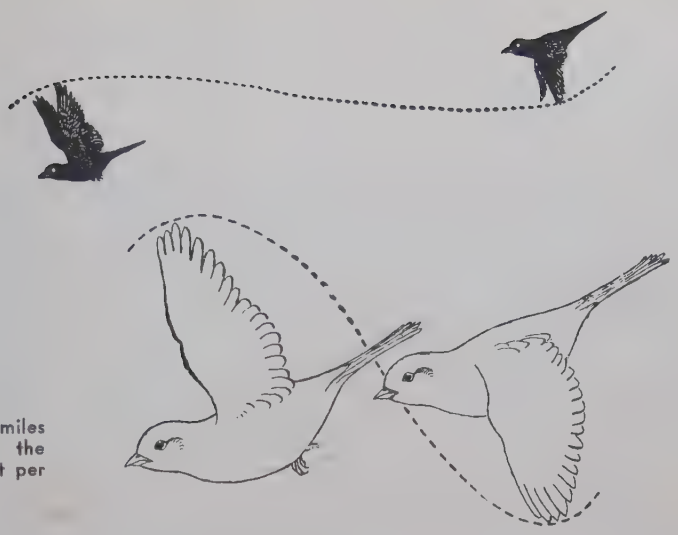
While we do not need to provide a food encrusted bird house such as that at the left, this is the time of the year for us to give thought to the tufted titmouse above, or the nuthatch at its left, and provide some such feeding station as is shown at the top of the page. Surrounded by civilization, our winter birds find many of their normal sources of food gone. If we will provide for them we will enjoy a treasured companionship and joy.

Wings

Fashions and habits of flight among some birds and insects

By S. F. AARON

Illustrated by the author



COMPARISON OF FLIGHT

Trajectory of the wing tips of a crow flying twenty miles per hour with three wing strokes per second, and the trajectory of a sparrow's wings when flying twenty feet per second with twenty wing strokes

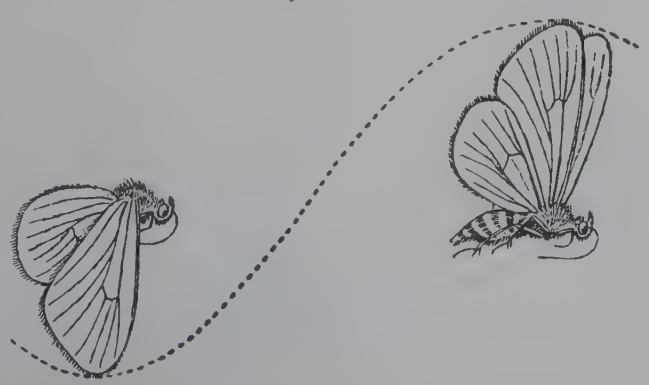
DEVELOPMENT of flight in the animal kingdom has no doubt been due to a long process of selection, yet the mechanism and method in principle are uniformly simple. There can hardly be a question but that the inherent tendency derived from fin motion first established the incentive toward propulsion through the air, the chief purpose being to escape from terrestrial enemies. Eventually it was found to be a means of capturing food.

Wings are of stretched skin, as in the bats; of feathers, as only in the birds; of membrane chitinous tegument or prolongations of the exoskeleton, as with the insects. They are broad and short with the general contour, being ovoid or almost circular, (grouse, partridges, butterflies, grasshoppers and small bee-flies); they are long and proportionately narrow, (chimney swifts, night-hawks, the plovers and snipe, the terns and skimmers and most of the insects); and of a vast variety also in between.

More depends upon muscle, especially in the matter of speed, than upon the shape of wings. Bee-flies, andrenid bees, carpenter bees, sphinx moths, noctuids and skipper butterflies, with wings comparatively smaller in proportion to their bodies, show a much greater speed and proficiency in flight control than do crane-flies, perlas, ephemera, caddis-flies, butterflies of the larger sizes, *Cecropia* and its kindred, agrion dragonflies and the true Neuroptera. Much the same may be said of certain hawks, teal ducks and shrikes in comparison to herons and pelicans.

SLOW-FLYING INSECTS

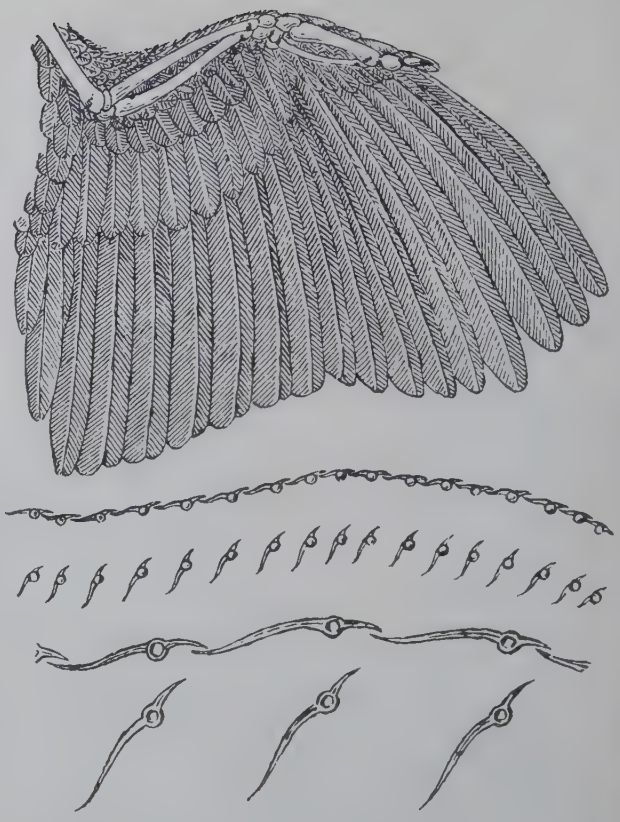
The wing expanse and resistance exceed the muscular control in the swallow tail butterfly, plant louse and golden eye above. Below, the trajectory of the wing tip of a Noctuid moth flying thirty feet per second and with a wing vibration of thirty-six strokes per second



To maintain the general principle of flight the mechanisms and methods of wing control do not differ. Propulsion is due solely to the driving of an angled surface against the air and is best illustrated by the propeller blades of an airplane. The reverse is a windmill wheel in which the wind drives, instead of being opposed. The angle necessary for ordinary flight is not due to the will of the flying creature, but is a highly developed, fixed condition. The angled surface is in all cases slight; the difference in bracing between the anterior portion of the wing and the posterior surface simply supplies the angle in the downward sustaining stroke.

Sufficient anatomical data of wing construction may be obtained by noting the feather attachments to the radius-ulna portion and to the carpels with the direction of the flight feathers; also the membrane adherence to the same parts in the bats, all with regard to resistance of the air. In the insects the supporting veins may be readily seen in the wings.

So much for the downward lifting and propelling stroke; the upward lift of the wing is also thus enabled to take a position that gives the least resistance to the air and may be compared to a tendency that a rigid surface would have to drive the body downward and to check its propulsion.



BIRD WING SHOWING FLIGHT FEATHER POSITION

Upper drawing shows their relation to the bony structure while, below, are sections of the flight feathers during the downward stroke and upward lift of the wing, pivoting on the quills

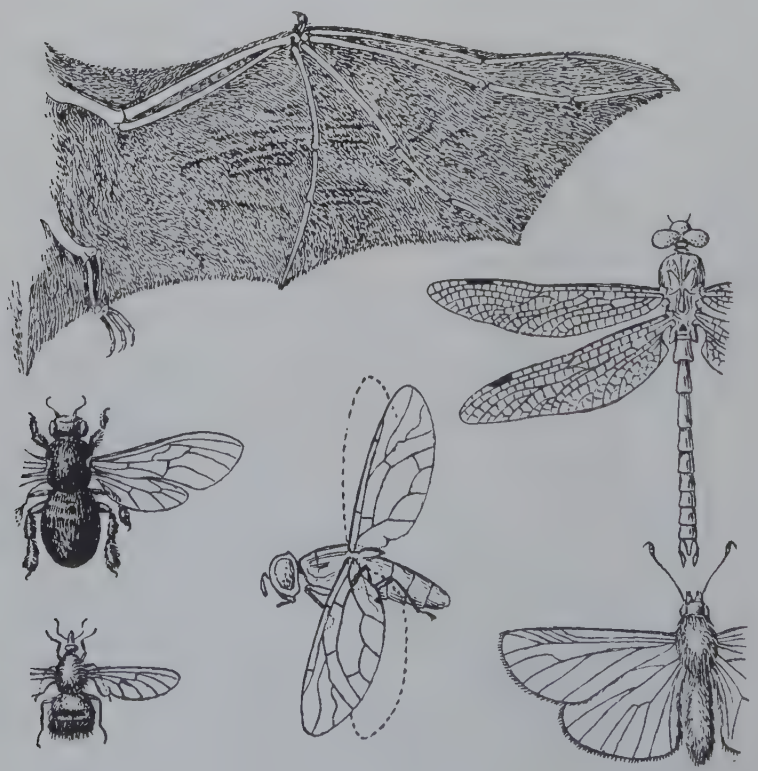
Therefore it will be seen that to gain propulsion and to expend the least effort toward lifting, the wing motion of a creature flying horizontally must be always exactly vertical, or at right angles to the line of the body and the direction of flight. In other words the motion is from directly above the wing attachment to directly below it, and when the direction of flight is changed either up or down at whatever angle it can be maintained the stroke of the wing is always maintained at right angles to the body.

One exception is that of hovering, or of maintaining a stationary position in the air, as practiced by the humming-bird and sphinx moth before a flower, and the bee-fly and carpenter-bee sportively suspended to observe the antics of their fellows. In such hovering, by reason of the wing attachment and bracing, the propelling force of the angle must be counteracted and thus the strokes are directed from above and a little behind to below and a little in front of the right angle. This direction of the wing strokes can readily be observed by the aid of a field glass when a hovering sparrow hawk is suspended sidewise to the observer, and by close observation of the wing gleam of a bee-fly stationary in the air. This direction of the wing motion is also seen when birds are about to alight and wish to break the force of landing, as pigeons on a roof and gulls checking to pick up tidbits on the water.

Never is the downward wing stroke of any creature directed backward, for the powerful uptilting of the posterior portion probably exerts the greatest momentum that can be given. Observation of frightened pigeons; of crows homing against a high wind; of a partridge chased by a hawk; of a hawk pursuing its quarry; of gulls hurrying to obtain food thrown from a ship; of a heron, crows and a hawk pursued by kingbirds; of chimney swifts darting after swift prey, will disclose this fact.

But the statement may be questioned, concerning the bat. It is quite possible that a bat is enabled to use its wings altogether more twistingly than that of any bird. Its aerial acrobatics surpass those of any creature anywhere near its size and weight and are equalled only by the swifter insects. No bird, not even the swallows and flycatchers, can go in one direction at great speed and turn a sharp angle or entirely around within its body dimensions, but a bat commonly performs this stunt. Is this due to the superior wing construction, or more powerful muscles?

That a membranous surface can offer a greater force than feathers against the air may be undoubted. It is impossible to imagine anything better suited for the purpose than the wings of bats and insects. But



WINGED SPEEDSTERS

Drawing shows little brown bat wing and bony structure, also the wing veinings of the carpenter bee, bee fly, dragon fly, little Bombylius fly and skipper butterfly. The side view shows the wing motion of the bee fly hovering, the dotted line the motion when darting

feathers also are admirable, especially regarding the individual formation, their lightness, peculiar power to waft the air and the construction of the quills. Herewith Nature has performed one of her cleverest tricks: while the development follows a hereditary influence derived from hair and bristles, the feathers used in flight (primaries and secondaries) make a definite use of the round quill which is simply a pivoting shaft, turning the feathers flatwise, each braced against its neighbor to form a resisting surface in the downward stroke of the wing and turning edgewise to permit the air's slipping through with the upward lift. Thus each feather by the nature of its wider webbing on one side works like the wing as a whole.

HOW THE HAWK FLIES

Upper pictures show wing in downward stroke midway and upward lift, lower drawing the extent of wing motion in most birds when flying

It is almost useless to make comparisons of the swiftest-flying creatures; that can only be approached by incomplete data. If one should try to make a guess he might begin with the swifts, swallows, plovers and include the black skimmers, some of the terns and probably the teals and golden-eye, refuse to ignore the night-hawk, bring in the falcons and accipitrine hawks as good seconds and thirds, include some of the flycatchers, the flycatching warblers, the shorelark and the crossbills, and then end up with the conjecture that the championship must go to the hummingbirds and the bats. But the latter do little to prove superiority in speed. The bat only flits about and rarely straight away. The hummer, when desiring to leave a bed of tasted flowers for parts unknown, hesitates so little that to follow its flight one's eyes would have to pop out and go along as though shot from a gun.

It is, however, not difficult to pick some of the slowest fliers. Often they can be gauged by the speed of one's car. Thus the woodpeckers, thrushes and most finches cannot keep up to a twenty-mile-per-hour speedometer. Jays and orioles are about as slow, but barn swallows, going unevenly in one direction for at least fifty yards, will quickly get well ahead of a 40 m.p.h. speed. Following a sparrow hawk intent upon picking up small birds dusting in the road demanded a 45 m.p.h. speed to be in sight of the snatch. Savannah sparrows, migrating, can be easily kept in sight by driving at a 20 miles' rate and I have seen a red-headed woodpecker swerving from pole to pole, unable to keep ahead of a cross-country trolley car not exceeding a mile in two minutes so that the bird was nearly caught in my hands before it pitched high to evade the car roof. I think it a fair statement that few of the passerine birds can exceed, even during the momentum gained in their migrations, 40 miles an hour. I am well satisfied, from observations with a stop-watch, that swallows going south in a leisurely manner and teal ducks making long flights attain 50 miles an hour, though hardly more than that.

A friend has aided me in timing certain birds, an effort mixed with many failures. Stationed on two points of land jutting into a coastal bay and 419 yards apart, as measured by triangulation, we used signals and a stop-watch during a very light breeze and we found that two white egrets covered the distance in 57 and 62 seconds, a brown pelican in 66 seconds, a redhead duck, evidently in a hurry, in 48 seconds and a flock of yellowlegs in 51 seconds.

The comparative speed of hawks may be somewhat approximately measured by noting how they overtake or fail to capture their prey. A sharp-shin will pick up an English sparrow or robin in the air without much trouble, but may fail to catch a nuthatch or a warbler in fair chase. I have seen a peregrine falcon, while soaring close to the ground, dash at a killdeer that started from the ground and flew away from the hawk within about 200 yards. There is not the slightest evidence for the statement by a recent writer that the peregrine and gyrfalcon are the swiftest of all birds, except that the famous downward plunges of these birds aid them, but that is not flying. They seldom overtake ducks, doves or shore birds in straight-away pursuit and when any of the hawks are found with the remains of swift birds in their stomachs they have picked up the young or caught the adults unawares. I have seen a swallow dodge a pigeon hawk with the greatest ease and a ruffed grouse keep well ahead of a goshawk across a narrow mountain valley. When noting the speediest birds it is well not to forget the kingfisher.

Concerning the insects we can only know that the bee-flies are hardly surpassed on the wing by anything; that they and the andrenid bees have the highest pitched wing velocity determined by the tuning fork, and that these small creatures and the larger dragonflies do stunts in the air that are really beyond understanding.

From early days, of course, man has always envied the flight of birds and attempted to imitate it. Even in mythology Icarus sought to ape the soaring of a bird, and down through the ages man has striven to conquer the air, attaining success only within a generation. There are marvels of bird flight sufficient to inspire such a desire to imitate it. One of the most dramatic, perhaps, is the courageous migratory flight of the tiny hummingbird over miles of billowing ocean. Man marvels, also, at the not infrequent records of our shore birds in spanning the ocean from shore to shore, bearing on their leg a banding tag that proves their achievement. Thus has flight intrigued us for centuries, has lured into an element that we must master.

OBSERVING THE FLIGHT OF HAWKS FROM THE STRATEGIC MOUNTAIN TOP
This year, for the first time, the birds start South without facing a hail of shot that has, in past years, killed thousands of these beautiful and valuable birds

A HAWK SANCTUARY

Pennsylvania mountain is first refuge for these birds

By HENRY H. COLLINS, JR.

FROM northern New England to northern Georgia the great Appalachians divide eastern America in half. This system is split up into a number of roughly parallel ranges. The wider and wilder of these form the backbone of the mountains, and they are separated by canoe-shaped valleys from the lesser ridges that flank them on the east.

These mountains—the Alleghenies, the Blue Ridge, the Shenandoahs, the Great Smokies, and all the other ridges of the Appalachians—are the great arterial highways of the autumnal migration of our hawks. Winds, when they strike a mountain range, form a powerful upward current of air. On this a hawk can float almost without wing motion. To go forward it has merely so to poise its wings that the upward motion of the air is converted into forward motion through its body. With this natural aid these birds migrate vast distances with little effort. These uninhabited ridges, then, are the ancestral flightways of the hawks. Here pigeon and red-tailed, broad-winged and red-shouldered hawks, even ospreys and eagles, have coursed majestically southward through unnumbered centuries. To the keen eyes of the raptores these lean ranges must look like gigantic mole-hills; but they draw birds like a magnet from far into the surrounding countryside. Here is a great natural roadway. Every hill is a milepost, and its entire summit is a point of vantage from which to escape enemies or capture prey.

Blue Mountain, not far north of Reading, Pennsylvania, is particularly famous for hawks. Indeed, it has been named Hawk Mountain. This easternmost outpost ridge of the Appalachians runs northeast and southwest. Its fame lies in the fact that just above Drehersville there is a zigzag in this mountain with a cross ridge connecting the zig with the zag. Furthermore, a passable dirt road crosses over close to this cross ridge, which is bare of trees here and rich in jutting sandstone promontories. The result has been that in the past two or three decades, and especially since the war, this has become more and more a resort for gunners, even from as far as Philadelphia, sixty miles away.

Let me take you there on a bright October Sunday two years ago. Fifty cars line up along the road in the course of the day. A brisk wind is blowing and this means plenty of hawks; for fewer migrate in calm weather when they must fly more and float less. The hunters, as many as 150, are scattered in large and small groups on the main promontories of the cross ridge, and on the "slide" of the west side, where some of the heaviest

THE SAD HARVEST OF "SPORT"

Hawks destroyed by the "sportsmen" who each year turned the mountainside into a shambles

slaughter takes place with a veritable broadside of shot.

Far to the northeast, at the limit of vision, a tiny black speck suddenly takes form and draws rapidly nearer. In a minute or two a magnificent red-tailed hawk floats low over the cross ridge. A dozen guns bang out. It falls. Two more specks appear on the northern horizon, and in a few minutes two more red-tails plunge into the forest below. Soon some sharp-shins skim along at eye level. It is doubtful if half get by unscathed. Later an osprey, protected by Pennsylvania statute, becomes the living target, and then a rare and beautiful peregrine falcon. Meanwhile the commoner species go by in increasing numbers through a hail of bullets.

In September it is broad-wings. October sees the height of the accipiter flight, while red-tails and the larger hawks are more abundant in November. The species differ but the slaughter remains the same. In an hour and a half one October morning, and from a space of only a few hundred square feet, we picked up 230 dead hawks, all obviously killed within the preceding ten days. Thousands and thousands each season meet their fate here. From Labor Day to December this frightful carnage continues.

No mercy is shown. The birds are not necessarily killed; many lie wounded, unretrieved, at the base of the rocky outposts down which the hunters are too lazy to climb. Here for days the injured suffer hunger and thirst until they gradually succumb to their wounds, or fall a prey to the wood-rats and foxes that frequent these rugged hillsides.

It is scarcely necessary here to allude to the benefits of hawks to mankind. Their value to agriculture has long been scientifically demonstrated. The bulk of their food is rats and mice, snakes and insects. By these services they greatly overpay the farmer for the occasional fowl they take. In fact only two or three species even include birds as a major item in their diet. Of these the sharp-shin confines himself to small species; the Cooper's, which takes fewer but larger ones, is becoming quite uncommon; and the duck, pigeon and goshawk are so scarce as to make their depredations negligible.

In addition to their benefit to the farmer, hawks are of increasing interest to the vast army of Nature lovers. Majestic in flight and fearlessness, graceful, speedy, and beautiful, hawks and eagles are indeed the "monarchs of the air". Yet they are becoming scarce. A good bird-watcher now is lucky to see two or three in a whole day's trip, where ten years ago he would have noticed a dozen. We certainly do not want to emulate England, where centuries of persecution have practically destroyed every hawk in the country. Yet here at Blue Mountain, just one cross-roads in their migration highway, this terrific slaughter occurs. No one knows how many other such death traps exist. But we do know that these ridges are concentration points, and that the individuals killed here represent the hawk population of hundreds of square

INJURED BUT ALIVE

Many of the birds hit fell on the mountain slope and were left there slowly to perish while the barrage concentrated on others

miles of the surrounding territory, which is tributary to this migration route.

This is the situation that confronts Pennsylvania bird lovers. The archaic laws protect only the sparrow hawk, osprey and eagle; and, though the law protects, its wardens do not. How can a conviction be made when a dozen guns blaze at the same bird, and hunters can't tell the species apart? Sunday, when all other hunting is forbidden, gunners massacre the birds of prey.

I have written as if this still exists. Happily *it does not.* This year for the first time it has been ended. While other "conservation" societies sat by, wrung their hands, and did nothing, Mrs. C. N. Edge, chairman of the Emergency Conservation Committee, acted. She leased this entire mountain top, shooting stands, promontories and all, with an option to buy. Going on faith and borrowing some money she took possession, posted the land and employed a warden to watch it.

Stunned, the gun clubs and gunners, and, it is whispered, the ammunition companies and dealers, did everything they could to block her. Lawyers were employed to try to break the lease. Violence was hinted, and it was found necessary to employ a deputy as a guard. But Mrs. Edge was successful. She has blazed a new trail in bird-protection. Here on Blue Mountain, Pennsylvania, is *the first Hawk Sanctuary in the world.* The result has been that for the first time in sixty years the hawks have journeyed South unharmed. Instead of parties of gunners shooting all day Sunday there have been increasing groups of bird-lovers studying the amazing wealth of raptores that course by here through the autumn. Maurice Broun, ornithologist-in-charge, has kept an illuminating series of records for each day during the season, an analysis and summary of which is shortly to be published. I can only touch a few high spots in his record of raptore migration.

In addition to the buteos—the wide-winged, fan-tailed red-shoulder, red-tail, and broad-wing—and the falcons—the duck, pigeon and sparrow hawks—there have been, of course, both accipiters—Cooper's and sharp-shinned—the osprey and the bald eagle. These we might have expected, although the duck hawk is now very rare. But a party from Philadelphia early in October (twenty carloads of gunners were turned away that day) saw the golden eagle, one of our rarest Eastern birds. On October 12 two golden eagles were seen, besides twenty goshawks, and one bird that was tentatively identified as a black gyrfalcon, so rare that even Mr. Broun hesitated to officially record it. On October 28 the Delaware Valley Ornithological Club of Philadelphia organized a special fall field trip to the sanctuary, which has now become one of the principal sites of ornithological interest in the East.

However, *it is not safe yet.* The land must be bought to safeguard it forever. A campaign is now under way to secure enough funds to purchase this preserve outright, and properly to endow it, as a warden must be there at least three months each year.

In rejoicing over the establishment of this sanctuary, however, we must not lose sight of two other facts. First, this is only one of a series of slaughter spots; others will have to be taken up also. Second, this is still only a partial measure for the salvation of our hawks. They can still be shot elsewhere; and they will be until ornithologists and Nature-lovers throughout the country have forced laws through their State legislatures protecting all hawks, and have had these laws reinforced by a Federal statute. This must be our long time goal, and the character of a conservation society can well be determined by its attitude upon this subject of protection of our hawks and owls.

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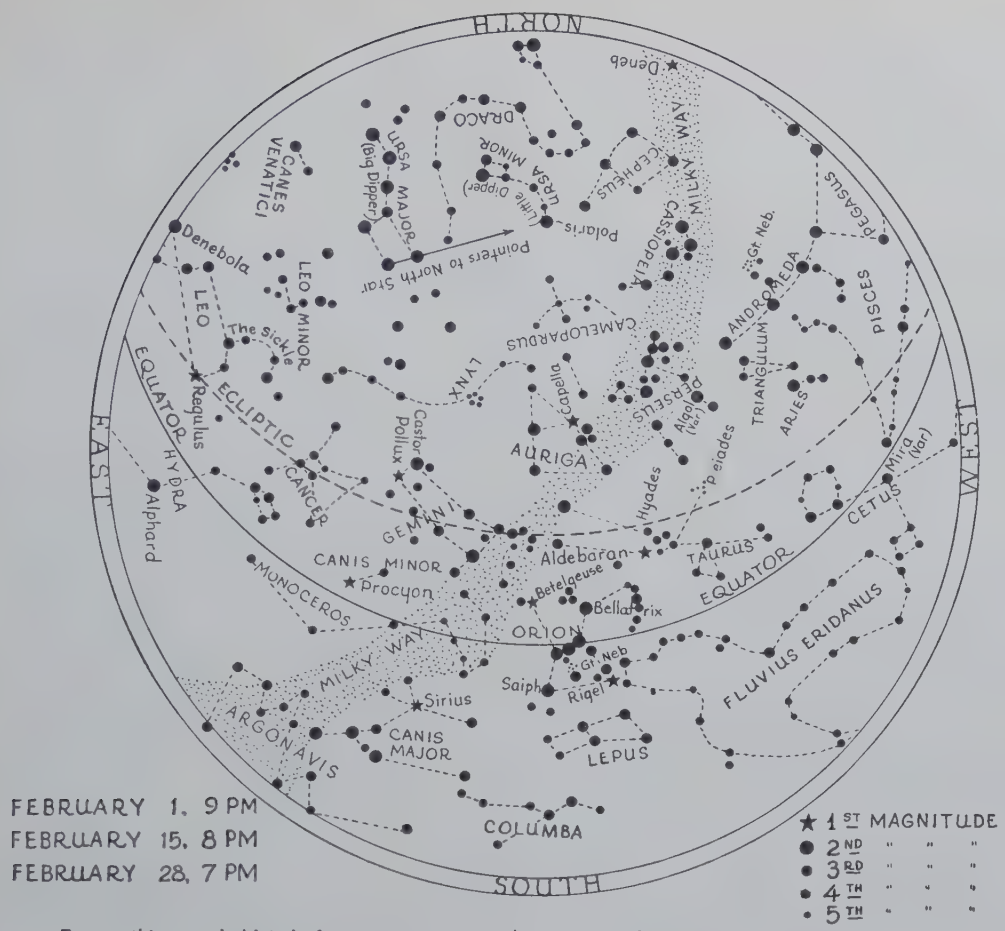
Trapped

By W. M. HARLOW

THE little brown bat in the picture looks contented enough perched upon a cluster of burdock heads. However, instead of a comfortable landing place, the multitudes of hooked bristles proved to be a deadly trap from which there was no escape.

How this diminutive night flyer happened to collide with such a formidable array of sharp hooks can only be surmised. Perhaps this was the climax of an exciting chase after some hard pressed insect which took sudden refuge behind the protecting burdock heads. In any event, our web-winged friend suddenly found himself spread-eagled upon myriads of clutching spines and no amount of struggling on his part could procure his release. When first found in the early morning he could still emit a few squeaks, but by the time an interested rescuer arrived, the hot summer's sun had put an end to what must be an unusual incident.

A somewhat similar accident led to the death of another small bat. While winging its way over a field its wing was caught by the spur on a wire fence.



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south

THE SOUTHERN CROSS

Where and When It May Be Seen

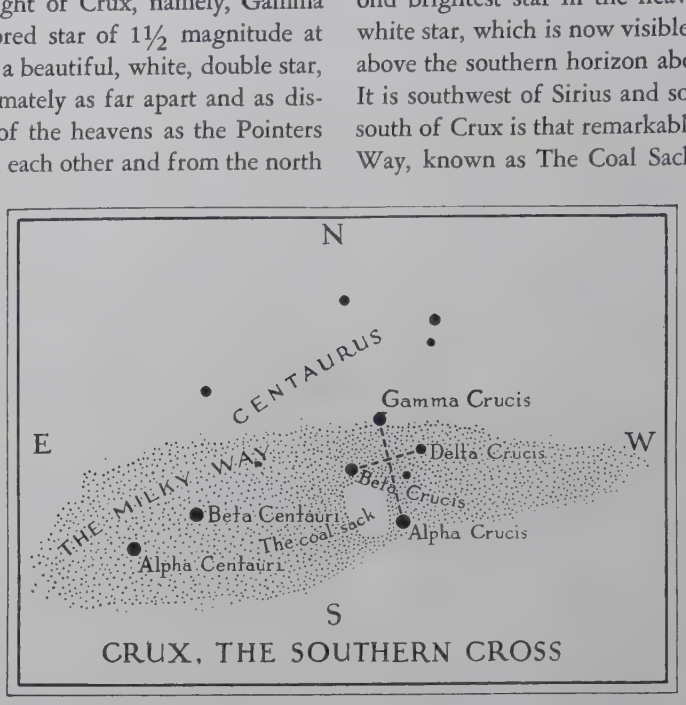
By ISABEL M. LEWIS

IF ONE lives in northern latitudes it will be necessary to travel at least as far south as Southern Florida, in the United States, to see the far-famed Southern Cross. And it will be seen there only for a short time close to the southern horizon at or near the time of its meridian passage. In early February one would have to be up between three and four A. M. as the Southern Cross passes the meridian about 3:45 A. M. on February 1, and shortly before 2:00 A. M. on March 1. On March 30 it is on the meridian, due south, about midnight, and it is not until May 14 that it crosses the meridian at 9 P. M. Travelers from the north to Miami or Havana may not expect to see the Southern Cross in February, therefore, unless they are willing to be up several hours before the sun.

It may be helpful to remember that Delta Crucis, the star farthest west in the Southern Cross, and the one that crosses the meridian first, has the same right ascension, within a minute of time, as the star at the juncture of the handle and bowl of the Big Dipper, known as Delta Ursae Majoris. Therefore these two stars are on the meridian at practically the same time. Both are stars of the third magnitude and the distance of the star in the Southern Cross from the south pole of the heavens is the same, within about a degree, as that of the star in the Big Dipper from the north pole. When in our spring, then, we see the Big Dipper riding high above the pole in the evening hours we may picture the Southern Cross at the same time high in the autumn sky of the mid-latitudes of the southern heavens, above the south pole of the heavens. If we are then south of the 27th parallel of latitude we may see it nearly due south in the early evening hours. The farther south we go the higher it will appear in the southern sky, until in the latitude of the Straits of Magellan the star at the top of the Cross passes the meridian nearly in the zenith.

Crux, as the constellation is known astronomically, is embedded in a brilliant but narrow portion of the stream

of the Milky Way which here comes nearest to the south pole of the heavens. The southern heavens have no bright star to mark the position of the south pole, which lies in a region singularly devoid of conspicuous stars. The two stars which mark the upright of Crux, namely, Gamma Crucis, a deep orange-colored star of 1½ magnitude at the top, and Alpha Crucis, a beautiful, white, double star, at the bottom, are approximately as far apart and as distant from the south pole of the heavens as the Pointers of the Big Dipper are from each other and from the north pole of the heavens. The two stars of which Alpha Crucis is composed are of 1½ and 2nd magnitudes, and their combined light is equal to that of a standard star of the first magnitude. Alpha Crucis is one of the twenty brightest stars and it is the nearest of all these stars to the south pole, though distant from it about 27 degrees. Delta Crucis and Beta Crucis, which mark the cross-arm, are of the 3rd and 1½ magnitudes respectively. As we have said, Gamma Crucis is a deep orange in color; the other three stars, Alpha, Beta and Delta, are all a brilliant white. So small and compact is the Southern Cross that it could be dropped within the bowl of the Big Dipper with ample room to spare. Crux is approximately equal in size to that small constellation, southwest of Spica in Virgo and a rider of Hydra, known as Corvus, The Crow, outlined by a small quadrilateral of third magnitude stars. Corvus is due north of Crux about forty degrees and so is on the meridian at the same time.



CRUX, THE SOUTHERN CROSS

It has been said that travelers from the north seeing the Southern Cross for the first time have frequently expressed disappointment at its appearance. If one sees it only from the latitude of southern Florida, or Cuba, this is not surprising, for its altitude above the southern horizon is there so low that it cannot be seen to advantage, the brightness of its stars being dimmed by the greater density of the atmosphere near the horizon.

Although the symmetry of the Cross may be marred somewhat by the presence of a fourth magnitude star within it and nearly on a line with Alpha and Delta, and by the fact that one of the stars is noticeably inferior in brightness to the other three, it must be nevertheless a beautiful object when seen to the best advantage in the mid-latitudes of the southern hemisphere in the midst of its remarkable surroundings. Crux is bounded on three sides by the fine constellation of Centaurus, The Centaur, and directly to the east and only a few degrees distant are the two brilliant first magnitude stars, Alpha and Beta Centauri, which remind us of the twins in Gemini, Castor and Pollux. Alpha Centauri, noted as being the nearest of the first magnitude stars to the earth, is farther from the Cross than Beta. To the northwest of Crux is the finest of all constellations of the southern hemisphere, Argo Navis, and in this constellation is Canopus, the second brightest star in the heavens, a magnificent bluish-white star, which is now visible in our southern states just above the southern horizon about nine P. M. February 1. It is southwest of Sirius and southeast of Orion. Directly south of Crux is that remarkable dark region in the Milky Way, known as The Coal Sack, which startled Herschel into exclaiming, when he saw it for the first time, "Here is truly a hole in heaven!" In contrast to the brilliant region of the Milky Way in which it appears it seems like an abyss of inky blackness as great in area as the Cross itself. It is believed that this is one of the dark nebulae which abound in the heavens, appearing exceptionally dark by contrast with the bright background of star clouds of the Milky Way against which it is seen projected.

To the inhabitants of the southern hemisphere the Southern Cross is a celestial clock. When it crosses the meridian the upright of the Cross is in an erect position, lying due north and south. Since it is known at what hours of the night, in different seasons, the Cross is inclined or upright, and as it advances regularly in position four minutes a day, it serves as a valuable time-piece to those who have learned how to read it.

To the early explorers this beautiful celestial Cross was, as Humboldt expressed it, "a sign of the faith planted by their ancestors in the deserts of the New World". Possibly this has much to do with the romance and poetry associated so universally with the Southern Cross.

On February 3 there is to be a partial eclipse of the sun visible in all parts of the United States. In the eastern states about four-tenths of the sun's diameter will be covered by the moon at greatest eclipse, which will occur near 11:30 A. M. Eastern Time. In the central states the magnitude of the eclipse will be between five-tenths and six-tenths of the sun's diameter, and the maximum eclipse will occur soon after 10:00 A. M., Central Time. In the extreme western states the sun will rise partly eclipsed, the amount of eclipse varying in different localities. In the southern states the eclipse will occur at about the same time, approximately, as in the eastern or central states, according to whether Eastern or Central Time is kept.

Among the planets this month, Mercury will be at greatest elongation east of the sun on February 1, and may be seen for a few days in the evening twilight low in the southwest. Venus and Mercury are also in conjunction

on the last day of January, so the two planets will not be far apart for several days. Venus will be visible low in the west throughout the month. Saturn will be in conjunction with the sun on February 20 when it passes from the evening to the morning sky, and will not be visible during the month because of its nearness to the sun. Mars is now in Virgo, and rises after ten in the evening, the middle of the month. Jupiter is still in the morning sky. On February 11 it is in quadrature with the sun, when it rises at midnight and may be seen on the meridian due south at sunrise. It is in the constellation of Libra throughout the month some distance to the south and east of Mars.

A Plea for Sundials

By I. THOMPSON SMITHERMAN

THE vanishing sundial is daily becoming more rare in our period. That horologue of the early ages, man's most primitive clock, is passing. Its business use has served its day, perhaps. It has been displaced by a more elaborate invention which ticks off time after sunset. But artistically we might plead that this silent friend be given a permanent place about the American home—a sanctuary.

Many are aware that the origin of the sundial is credited to the shepherds of old, who conceived it while sitting patiently in the sun watching the shadows. They then fashioned it from a staff and stones, and later ornamented it with mottoes both touching and didactic.

Whether this legend is true or not, we do know that even to a stranger strolling about the grounds of a home—be it handsome estate or vine-clad cottage—the discovery of a sundial serves as a temptation to pause.

The Chinese also claim the credit of originating the sundial, and its use is common literally everywhere in China. Some patterns are even portable. The Chaldeans and Hebrews have left us voluminous records concerning its place in their lives. The Egyptians borrowed it from the Greeks and Romans, but fearlessly failed to return it. England passed it on to America along with boxwood hedges and lavender for the perfuming of linen folds.

There is no garden lover who will not prick up an ear to hear a scrap of lore about sundials, yet nearly all have committed crimes against them with crude modern settings, thus aiding and abetting their loss of caste.

If we yield to its true spell, we will think before we map the sundial's foundation. We will return to the ancient shepherds' plan and strive to catch a bit of real atmosphere for this silent sentinel. After all, a sundial is not an ordinary thing. It is even occasionally suspected of having a soul, and certainly no one would dispute the fact that it speaks to all who will pause in its presence. Its quaint, half-hidden mottoes whisper of moderate labors, of temperance and good hours; it extols the virtues of industry and frugality as the parents of abundance. Gently, and in silence, it tells us of the march of time.

But guiltily we must admit that slowly and surely this heart of every garden is ceasing to speak. Yet a sundial is something different and will not recapture its rightful place until we courageously demand a natural setting for its wistful teaching. Touch it with something precious—a vine, a flower, a stone—then only will it radiate its benediction again over every garden with Nature supplying the fringe of glory, enfolding it in its sanctuary.

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Titmouse on a Dogwood Limb

A poem-story of a dream that made a bird feel better

By
CLARA B. DEAN

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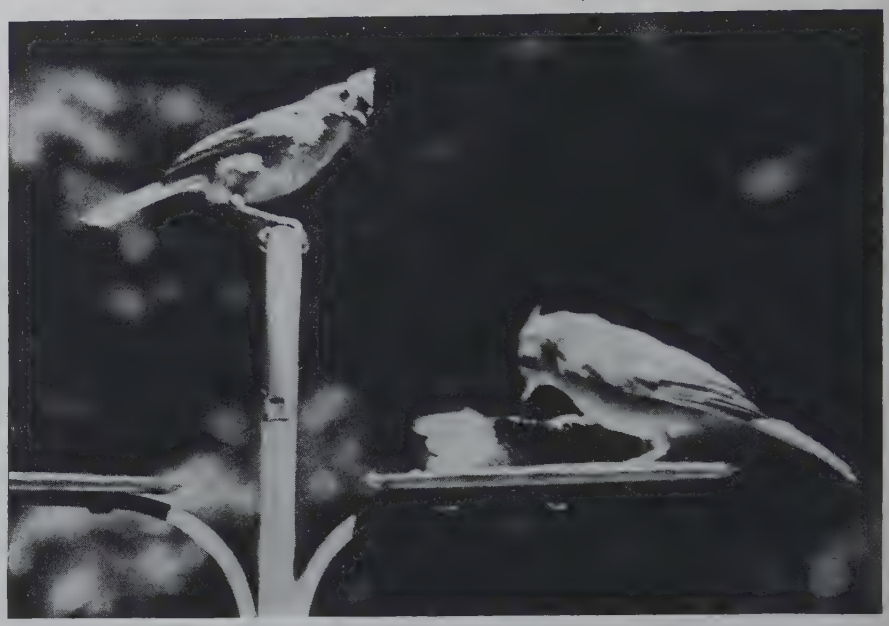

"Cheo, cheo," sang the Cardinal gay;
He sang and preened in a satisfied way.
The Towhee called, "Towhee, towhee,
I'll flash my tail, now look at me!"
But the poor little Titmouse, all gray and small,
Dropped his dull top-knot and sang not at all.

"Such a handsome big bird with a sensible name
Might well sing a song. I'd be doing the same
But I'm named for a mouse, a mouse of all things!
Me, a bird that can sing and fly with strong wings!"
So thought the Titmouse, grew drowsy a-thinking
Till his black little eyes were winking and blinking.

Then he ducked his tired head in his soft feathered breast,
Hooked his claws in a limb, went to sleep and to rest.
And a very strange dream came to comfort him
As he drowsed up there on the dogwood limb.
He heard a "Meow" as plain as could be,
"Me-ow, me-ow," but no cat could he see.

He carefully looked first this way, then that;
For he knew he had better beware of the cat.
But all he could see was the children's pillow
There on the ground by the Pussy Willow,
And down by the lily pool Cat-tails three
With their tails in the air where their heads should be.

Then he jumped and he squawked for he heard a "Bow-wow,"
Very close to his ear. What could it be now?
He ruffled his feathers and popped his round eyes,
He listened, he looked, he tried to be wise;
No pup could he see, though he knew he was right—
A white dogwood blossom had cut off his sight.

More and more puzzled, he heard a "Quack, quack,"
He craned his small neck till his bill touched his back;
He ruffled his feathers and popped his round eyes,
He listened, he looked, he tried to be wise.
The iris with Duck-bill "Quack, quacked" with a vim,
And a Gooseberry Bush waved a twig at him.

"Now what can it be?" Titmouse wondered; and then
He knew that he heard the "Cluck, cluck" of a hen!
He ruffled his feathers and popped his round eyes,
He listened, he looked, he tried to be wise;
And down by the rocks where the violets grow
Dainty blue Rooster Heads stretched up to crow!

The Chigger-weed shook, the Horse Radish sprinted,
The Pheasant-eye Narcissus squinted,
The Sheep Sorrel "Ba-a-aed" and the Goat's Beard, too,
The Snake Fern wriggled (no more could it do),
The Fleabane hopped on the Elephant's Ear—
And our Titmouse trembled and trembled with fear!

And then he waked up, jerked his bill from his breast.
The garden was quiet, the flowers at rest.
The thought of his dream filled his addled, small head
Till he puffed out his breast with pride and said:
"The Dogwood is lovely in spite of its name,
Chee wickey, chee wee, I guess I'm the same!"

He saw himself bright with cardinal red
With a crest grown taller a-top of his head;
He flashed his small tail as a proud Towhee would,
He tried a few notes and thought they were good.
"A small bird am I, and called a gray mouse?
A beautiful thing may be named for a louse!"

The white Dogwood blossoms were gracious and kind;
They knew cocky Titmouse; they hadn't been blind
To his sad drooping top-knot, his feeling of shame
For his smallness and dullness and animal name.
The blossoms were kindly: they danced there with him—
This plain little mouse-bird who bounced on the limb.

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How the Catfish Got His Moose Blanket

A MENOMINI INDIAN MYTH

Retold by
DOROTHY E. PLETCHER

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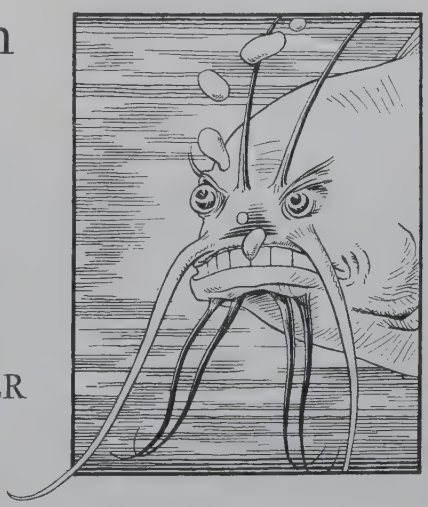


ONE day a little catfish was lying on the bottom of a lake, wishing for a nice new white moose blanket. By and by, who should come along but an old white moose with several of his children.

"Now, how can I get that hide for a cushion to lie on?" pondered Catfish. At last he decided to make the moose angry. And so he cried, "White one, your horns are long, but mine are longer yet."

At that Old Moose said to his children, "What a boastful fellow Catfish is. Run down and kick him. That will make him keep quiet."

But when the young moose went near the lake, Catfish shouted at them, "It isn't you I want. It's your father." The young moose reported what Catfish had said. This made Father Moose very angry indeed.

"Ha, ha!" he bellowed. "I'll attend to Catfish myself." And away he ran to the lake. "I've come to finish you," cried the Moose, snorting angrily.

"That is fine," replied Catfish. "Kick me right here on my chin." Now Catfish, the foxy fellow, has several great big horns at that very place. Up he turned on one side and raised his sharp spines. And when Father Moose kicked angrily at him, Catfish's spikes ran in between the Moose's toes. Oh, how they hurt! Although the Moose hopped out on shore, Catfish hung on until he was knocked off. The poor old Moose was able to run on only three legs. Soon he fell over and died.

Did you know that long, long ago, animals of all sorts could change their nature when they wished? That is how Catfish could walk right out of the lake in the form of a man. Catfish then took the white hide from Father Moose and made a nice bed of it in the water. Perhaps on the bottom of a lake you have seen the little bed that Catfish has to lie on there? That is Catfish's moose blanket.

Hiking and Camping Forum

Conducted by
Ernest A. Dench

Inquiries concerning the fields embraced by this department will be answered by mail if a stamped addressed envelope is enclosed. Address the department editor.

Brevities

The New England Council, with headquarters in Boston, is appointed official clearing house for all winter sports information from Connecticut to Maine. Winter sports manual may be published later on. . . . Los Angeles County maintains a card index file of 150 trail trips in Angeles Forest area. Latest information available to California visitors without charge. Apply to Department of Recreation, 240 South Broadway, Los Angeles. . . . Hawaiian Trail and Mountain Club provides a Visitor's Card at $1.00 monthly. Hikes held every week-end. Auto transportation to hikes available at one cent per mile. Prospective Pacific voyagers should write the secretary at P. O. Box 2238, Honolulu. . . . Knitted caps are decidedly drafty on windy winter days. A silk or satin lining should be added. . . . At this season Saturday afternoon hikes of the St. Paul Municipal Hiking Club conclude, by prearrangement, at a roadside restaurant, where dinner and entertainment prolong the happy hours together. . . . A food company, in issuing a camp cookery guide, avoids orthodox home cook-book measurements and weights. Very considerate, as desired utensils may not always be at hand in the wilds. Recipe portions are "Handful," "Fingers" and "Fingers of Fat." Book tells how to gauge them. For liquids conventional containers still prevail! . . . "Plenty of room for extra socks" rashly promises a footwear manufacturer. What happens if you order number eights—your city street wear size—when you really need size nine to allow for winter hosiery layers? . . . *Batona,* semi-annual publication of the Back to Nature Hiking Club, is synthetic only in name. A center insert carries the schedule. Remaining contents are of the magazine type. Art paper ensures perfect reproduction of photographs taken on hikes of this Philadelphia (Pa.) club. Moonlight hikes in mid-week appear to match all-day Sunday ones in popularity. . . . The twenty Metropolitan New York clubs affiliated with the New York–New Jersey Trail Conference provide more than fifty per cent of the Appalachian Trail administration funds. None of the money raised is used locally, these clubs feeling it can be employed to better advantage in other sections. . . . A western firm has had its popular-priced sleeping bag accepted for ranger use by the northern district of the U. S. Forest Service. . . . When tired of plain bread and butter for sandwich outsides, try buttered toast, cold. Out in the open, toasted bread adds piquancy to the meat or other fillings. . . . A new biscuit, while not edible, helps produce a camp meal. What freak of the baker's craft is this? Its chief ingredients are cork and resin, and within five minutes produces such a ferocious heat that even thoroughly wet wood will ignite. Yes, a campfire short-cut device.

On the Honor Roll

Active members of the Smoky Mountains Hiking Club who meet exacting requirements are now admitted to the *Veteran Hikers* inner circle. To be eligible, a member must take at least twenty-five per cent of the scheduled hikes during a three-year period. The hikes have to total not less than 300 miles. Qualifying trips include twelve major mountains, including Mitchell and LeConte. A special knapsack emblem is being designed for these *Veteran Hikers,* plan for which was conceived and executed by Professor H. C. Amick.

Canada to Mexico Trail

Existing trails through three National Forests from the British Columbia border to the Columbia River are being coordinated to produce the Cascade Trail. It will link the Skyline Trail of Oregon and the John Muir Trail of California. Eventually there will be a pedestrian route from Canada to Mexico. The U. S. Forest Service, with CCC aid, is adopting some of the Cascade Trail suggestions made by representative Washington State organizations.

A proposal advanced by Asahel Curtis, noted for his photographic studies of the High Sierra, is for a "feeder" trail confined to the meadows near the crest of the Cascades. Curtis admits the path is a concession to the automobile age, as it would link the state highway systems.

"The real hiking trips require several days and the packing of rather heavy outfits," Curtis contends. "The present generation is seeing much more on week-end trips with a great deal less effort. We should develop highways in connection with trails so that more outdoor people can share our pleasures without too much strenuous hiking."

Mr. Curtis is chairman of the Cascade Trail Committee of the Seattle Chamber of Commerce.

New York Walk Book

332 pages of walks within 100 miles of Manhattan—and not the hint of a street directory anywhere. True the *New York Walk Book* starts off with a few city rambles—to parks and historic shrines—but we are soon traveling from 30 to 50 miles by train. Now we are in the heart of husky tramping country—rugged mountain chains, 1000 to 1400 feet high, and gentler slopes of hills, swamps, abandoned farms, old iron mine excavations, caves, and second-growth forests holding isolated lakes and ponds. There must be at least 200,000 acres of minor wilderness for the Metropolitan hiker to explore.

The first edition of the *New York W Book,* published in 1923, set a high sta ard in this type of literature. The 1934 e tion maintains it with the exception of maps. Unfortunately, most of the gui books now appearing, whether undertak by clubs or commercial publishers, are affe ed by economical consideration—and ma minus contours are the result. Hikers a campers growl at still having to use go ernment maps in conjunction with guid books. Those we have spoken to would wi ingly pay a little more for a book with co tour maps.

In lieu of photographs there are ma charming pen sketches by Robert L. Dicki son. Raymond H. Torrey and Frank Pla are responsible for the text, which could n be in more authoritative hands. It is a $2.5 book, published by Dodd, Mead and Com pany.

A Misty Scottish Island

The Isle of Skye's penetrating brand o mist is continuous to the visiting hiker an spasmodic to the native. But when Jupite Pluvius does condescend to relax his holo there is a commanding panorama of bleak treeless mountains without a rival neare than Norway.

B. H. Humble's *Tramping in Sky* ($1.00) is a well-written log of two Scot who explored the isle on foot during a sum mer vacation. They also took the trouble to dig up Skye's stirring history and folk lore—immeasurably adding to the book's in terest.

A book primarily of value to skilled rock climbers is *Mountain Days in the Isle of Skye* ($3.00). Author J. E. B. Wright is an English Lake District professional guide. He undertook, with a few friends, to sample Skye mountains, at different seasons. Midges tormented them in June—and mists most other times. Both books are published by Grant and Murray, Ltd., Edinburgh, Scotland.

Government Offer to Campers

A camper needing land for a permanent summer home—one in harmony with the wilderness—will find the United States Forest Service willing to cooperate.

Individual plots not exceeding five acres are rented for indefinite terms at from $5.00 to $25.00 yearly. Building regulations are easy to comply with.

More ground—ten to twenty acres—is offered clubs and associations who desire to establish wilderness lodges.

National forests where this plan does not apply are the White Mountain in New England, and the Wichita in Oklahoma.

Apply first for literature to the Forest Service, Department of Agriculture, Washington, D. C. Next step is to communicate with one of the regional foresters, whose address will be given, and arrange to inspect likely plots in person.

These permanent camp concessions, offered for years, are not widely known. Many an outdoor lover, hit by depression years, will welcome the belated information. Even the Forum editor only stumbled on it by accident! How many other lesser-known services are buried in federal government routine?

A City Sanctuary

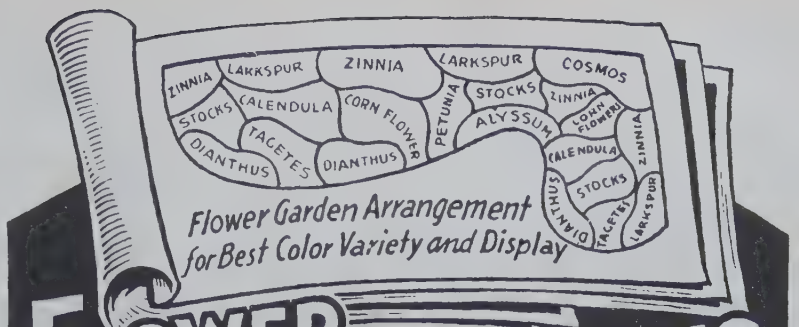
Nine acres of natural woodland on the Bronx River, between the new Thompson Memorial Rock Garden and the large iris plantation of the New York Botanical Garden, has been set aside as a bird and wild flower sanctuary within the limits of a great city. This splendid project is being carried out by the New York Bird and Tree Club with the cooperation of the New York Botanical Garden. Trees and wild flowers of the State will be planted and protected and birds will be protected and invited to stay during the winter through the provision of food. Entrance to this sanctuary will be permitted only to those whose honorable interest in wild life is assured. The sanctuary is to be made a memorial to Mrs. Nathaniel Lord Britton, wife of the founder and former director of the Botanical Garden. The sanctuary committee, headed by Mrs. W. W. Nichols, is now seeking contributions toward a fence that will encircle the area. It has been suggested that sections of this fence may be likewise designated as memorials by donors.

For Winter Gardeners

Richardson Wright is editor of the beautiful and sophisticated *House & Garden* and when he writes he writes in tune with the pages of the magazine he edits. We have precedent for that in his *Gardener's Bed Book* directed to the gardener who likes to read about gardens while the gnomes and elves and their ilk sport in the night-shrouded garden without. Now he gives us another book for the gardener in winter, not telling how to simulate the garden season within the brick walls of a house or the glass walls of a conservatory, but giving him garden inspiration in an easy chair. Mr. Wright dashes about in this book between the history of summer houses and persons who gardened and left rich results from their efforts. He gives us some fascinating lore of the past, some picture of individuals, of vogues and garden byways. From this book we will never learn how deep to plant an iris bulb or what to do about aphids, but we do get a charming picture of what gardening has meant in many places and in many ways. The publishers are Lippincott and two and one-half dollars is the price.

Nature Clubs

The School Garden Association of America, which has been actively interested in Nature Study in the public schools since 1910, has launched a campaign to bring together into a national organization the Nature Study and Garden Clubs which exist in the schools of the United States. A series of leaflets dealing with various kinds of club activity, medals of award, membership pins and other aids are being prepared. Special assistance will be given in the planning and organizing of new clubs in elementary schools as well as in junior and senior high schools. Superintendents, principals and club advisers are invited to get in touch with the chairman of the National Junior Club Committee of the Association, Karl H. Blanch, East Mauch Chunk High School, East Mauch Chunk, Pennsylvania.



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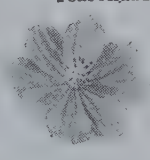

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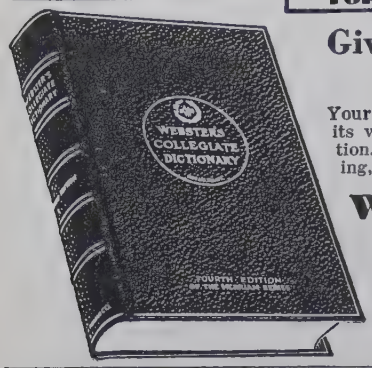

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Rock Garden Exhibit

The first national rock garden exhibit will be held in Cincinnati, Ohio, May 16 to 18, according to an announcement by the American Rock Garden Society. The exhibition will be held in connection with the annual meeting of the Society at the Hotel, Cincinnati, May 17. Those interested in the exhibition and the meeting should get in touch with Dorothy Ebel Hansel, 1 Fifth Avenue, New York City.

Bittersweet Going

The bittersweet is a decorative plant with its bright berries are appropriate to the holiday season. It is also a vitally important item in the diet of birds, the berries remaining on the vines after other natural bird foods have gone. So widespread and indiscriminate has been the gathering of bittersweet, however, that it not only endangers bird life but threatens local extinction of this plant if it continues. Many wild flowers have thus suffered and bittersweet bids fair to join them. Laws prohibiting its sale when gathered in the wild might help, and production as a supplemental farm crop on unused lands might solve the problem of demand.

Humane Calendar

An interesting and attractive calendar for 1935 has been brought out by J. Philip Kruseman, The Hague, Holland, in behalf of kindness and humanity to animals. Each page presents a photograph that is detachable from the page, humane legends in English and Dutch and a calendar for two weeks. It sells for $1.75 postpaid.

Tiffin Sanctuary

Combining a bird and wild flower sanctuary with preservation of historic trees, Tiffin, Ohio, has set aside Millstream Park as an example of the importance of conserving natural resources. This activity has had the cooperation of city officials, civic clubs, the Garden Club and scout organizations, and one of the main sources of inspiration for this work has come from Dr. A. C. Shuman, a life-long conservationist. Native trees from many historic spots in Ohio are being assembled and marked. Work of clearing the area has been done by the city's unemployed from municipal rather than federal funds. The park was formally launched with tree-planting ceremonies conducted by the local Garden Club and presided over by Mrs. W. H. Hopple. An island in the Sandusky River, which flows through the park, has been set aside and equipped as a community picnic ground.

To Newfoundland

On the eve of his departure for England, Sir Wilfred Grenfell writes asking that NATURE MAGAZINE be sent to Miss Pressley-Smith, The Grenfell Mission, St. Anthony, Newfoundland. He adds that he has in the past sent many issues of the magazine to Miss Smith who has copied many of the pictures in colored hooked mats.

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NEW YORK'S FRONTIER

(Continued from page 61)

While the hawks are shot at by farmers, they are wary enough to survive. Red-shouldered, sparrow and fish hawks all breed. Barred owls are never absent from along the river at several points where the forest rises highest and where a hemlock grove rising up a steep bank gives them cover.

To list the wild life is only to record the detail of a whole as satisfying to a lover of unspoiled outdoors as the far places sought in vacation days. I once traveled to the north woods in search of greater wilderness and found less than I had at home—less variety and many more kinds of insect pests. Friends used to getting their relaxation miles away marvel that so near New York it is there for those who seek it.

Of course there are cities other than New York where such conditions are duplicated. But New York seems so pervasive as to exclude the possibility of them in these days of rapid transit and suburban development.

In the movement for conservation, effort needs to be made to save near our big cities the few remaining wilderness-like areas in swamps, river courses and bottom lands so that samples at least of unspoiled Nature may be left nearby for the students and Nature lovers to come. The old frontier of New York on Nature is passing. Year by year escape into it is more difficult in time and effort. Only parks or the accident of control by a water company, as on the upper Hackensack River, will save its remnants.

Unusual Ant Hill

Frederic H. Millen, technical foreman of a Civilian Conservation Corps Company at Butler, New Jersey, discovered an unusual ant hill near the village of Oak Ridge, New Jersey. The ants had built a group of cones joined together at their margins and intercommunicating both above and below the original surface of the ground. The principal mound is about ten feet across and about three and one-half feet high. It is constructed in an almost perfect circle, except where three mounds of ordinary size connect with it, appearing as sort of foothills at the base of the slope. Measuring the ant hill was no fun because the ants were numerous and vicious.

Insect Parasites by Air

An army of tiny wasps that prey on the codling moth, one of the most destructive of all fruit insect pests in the United States, safely crossed the continent this summer by air express to aid apple growers on the Pacific coast. The beneficial parasites were reared at the Moorestown, N. J., entomological station of the United States Department of Agriculture from insects collected in eastern orchards, in which the codling moth is held in partial check by these natural enemies.

Rail express is impractical for runs longer than fifty hours because of the necessity for re-icing the traveling compartments of the insects. Unless the parasites when confined are kept at temperatures from 40° to 60° F. they become so abnormally active that they soon exhaust their limited energies and die.

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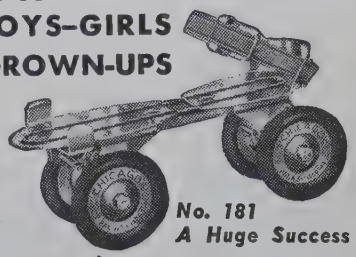

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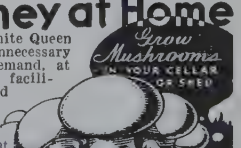

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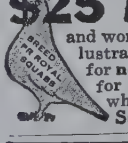

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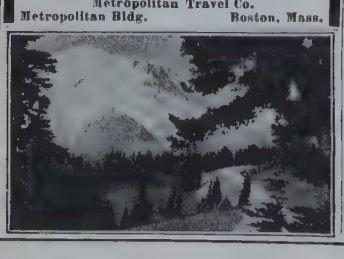

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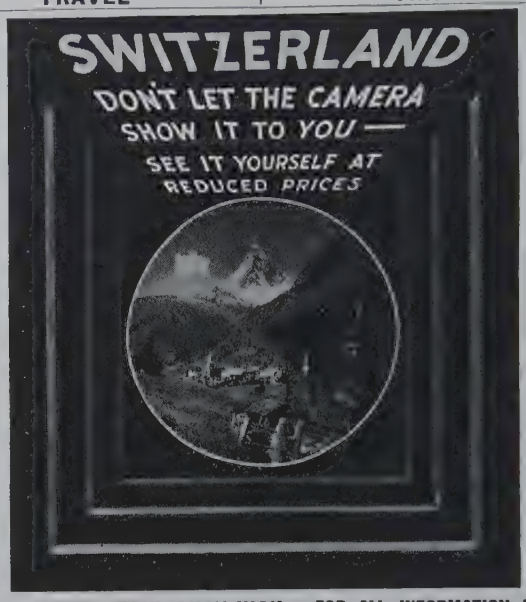

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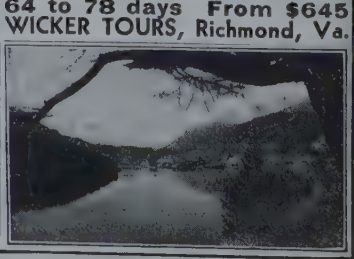

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Too Little Thought Given to Road Programs

SOME months ago we voiced considerable doubt as to the wisdom of the extensive building of new roads through the use of the greatly increased amount of available public funds. We expressed the opinion that some of these routes were unwisely opening up sections hitherto not easily accessible, with the result that the natural resources and attractiveness of the areas were being seriously endangered or ruined.

Interesting confirmation of our fears comes from the Southwestern Region of the United States Forest Service. While 1934 had proved to be the worst fire season on record, due to excessively dry conditions, foresters expected the hazard greatly to diminish with the coming of the summer rainy season. The rain came, but so did more fires. By the end of the year there had been more than twice the number of fires than the average for the previous six years.

Had it not been for the availability of members of the Civilian Conservation Corps and other emergency groups, it is certain that the loss from these fires would have been much greater. This was fortunate. But digging down for causes brings us to reaffirm even more emphatically our objection toward building new roads anywhere someone thinks a new road would be a nice thing to have.

It has been established that the increase in fires was to an amazing degree caused by man. New roads and better roads had brought more hunters, campers and tourists. More fires were left unextinguished; more matches and cigarets were tossed carelessly away. As the careless individuals went their way more forest fires were slowly being kindled from sparks into roaring and devastating infernos.

The comment of the office of the Forest Service confronted with this situation is that "it is indeed unfortunate that we cannot open up the forest resources to facilitate their use by the public without corresponding increase in fire hazard."

Yes, it is indeed unfortunate. It is, also, sad that, after years of extensive and well-considered educational campaigns on the part of national and state forest administrations, so many people are so utterly indifferent. Our public forests and parks have been set aside for the benefit of the people. They are public property and the individuals who treat them carelessly are guilty of vandalism, and theft from their fellow citizens.

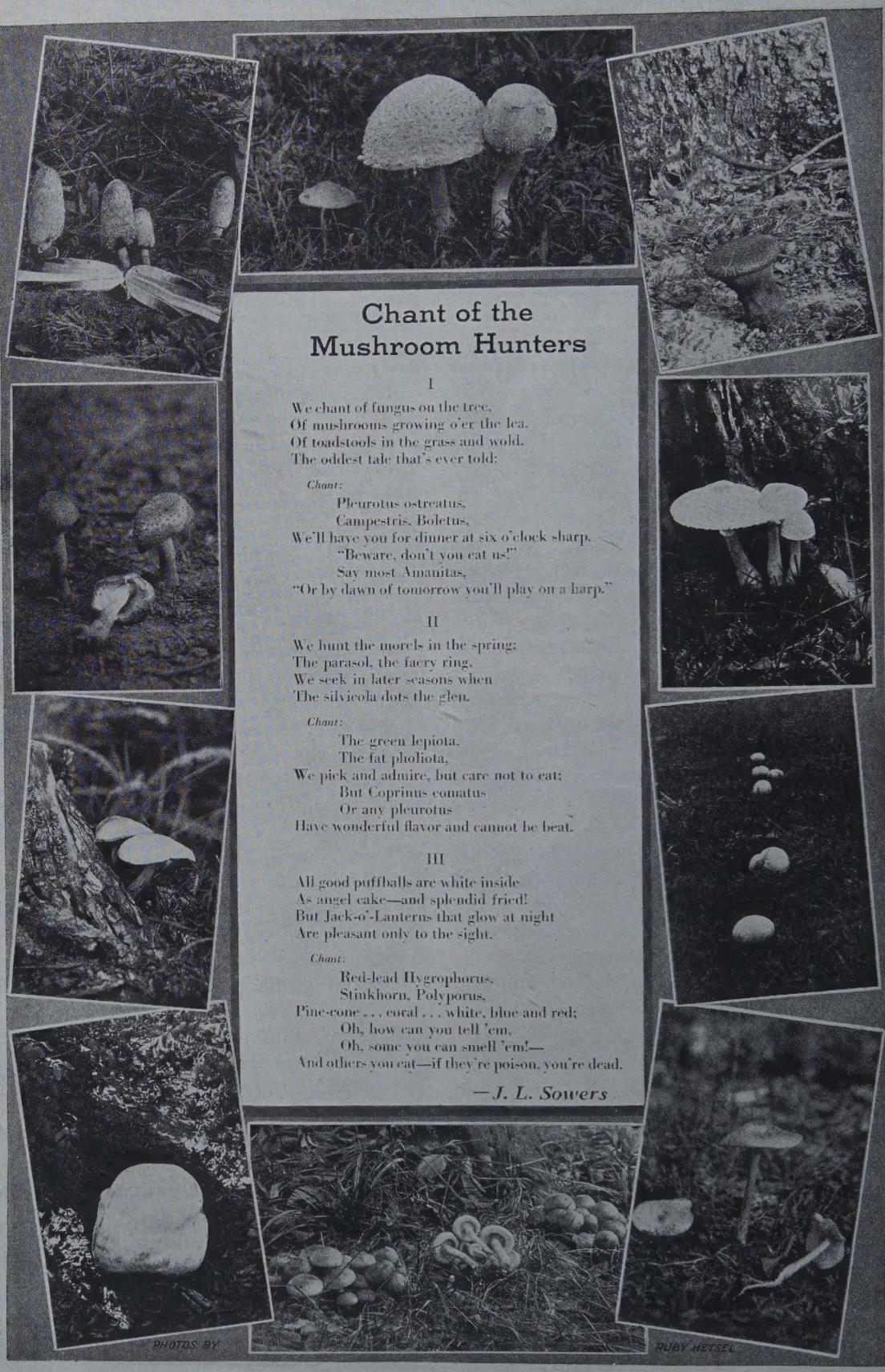
The fact remains that there *is* this indifferent and thoughtless element. And the further fact remains that they have been able to increase the damage such people do because numerous new roads have widened their opportunity. By the same token, when these emergency fire-fighting resources are withdrawn the roads will still be there, and we may logically expect greater areas to be destroyed by fire under the reduced protection.

American outdoor manners are not limited in their atrocity to carelessness with fire. There are still far too many people who leave nauseous litter at picnic and camping sites; who uproot and destroy wild flowers and shrubs; who disfigure trees, and who otherwise despoil public beauty and recreation spots.

A case in point is the new Skyline Boulevard which runs through—and, in our estimation, ruins—the proposed Shenandoah National Park. This road was opened up for a time and then closed because of extensive vandalism by the visiting public. Finally, after public pressure had become too great, the still not entirely completed highway was reluctantly reopened last fall. Not yet a National Park, there were no adequate means of administration and policing of the area. But the public wanted to ride the highway, to enjoy the fall scenery of the Shenandoah Valley, and to smell the fall air polluted by thousands of automobile exhaust pipes. They left behind a trail of litter ranging from egg shells to blown-out tires.

So now some twenty miles of highway scar the ridge, cutting through the heart of what is to be a National Park. Little or nothing of this area is reserved inviolate to litter and of interest to those who care for the unspoiled beauty of Nature. The Skyline Boulevard has accomplished that, and while it will serve greater numbers of people travelling in motor cars, we have never been able to regard that as a valid reason for creating a National Park.

There are many other instances of new highways imposed on wild and beautiful areas. Many of them have been hastily approved and after scanty consideration and study. Before another road building season starts let us hope that there will be a policy of scenic road construction based upon recognition of the need for proper preservation of our natural outdoor resources.



Chant of the Mushroom Hunters

I

We chant of fungus on the tree,
Of mushrooms growing o'er the lea,
Of toadstools in the grass and wold,
The oddest tale that's ever told:

Chant:

Pleurotus ostreatus,
Campestris, Boletus,
We'll have you for dinner at six o'clock sharp.
"Beware, don't you eat us!"
Say most Amanitas,
"Or by dawn of tomorrow you'll play on a harp."

II

We hunt the morels in the spring;
The parasol, the faery ring,
We seek in later seasons when
The silvicola dots the glen.

Chant:

The green lepiota,
The fat pholiota,
We pick and admire, but care not to eat;
But Coprinus comatus
Or any pleurotus
Have wonderful flavor and cannot be beat.

III

All good puffballs are white inside
As angel cake—and splendid fried!
But Jack-o'-Lanterns that glow at night
Are pleasant only to the sight.

Chant:

Red-lead Hygrophorus,
Stinkhorn, Polyporus,
Pine-cone . . . coral . . . white, blue and red;
Oh, how can you tell 'em,
Oh, some you can smell 'em!—
And others you eat—if they're poison, you're dead.

—*J. L. Sowers*

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